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Table of Contents

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| | | | |
|-------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------------------------------------|--------------|
| ORIGINAL ARTICLES— | PAGE. | BRITISH MEDICAL ASSOCIATION NEWS— | PAGE. |
| "The Treatment of Complications of Tuberculosis of the Spine," by HUGH C. TRUMBLE, M.C., M.B., B.S., F.R.C.S., F.C.S.A. | 516 | Scientific | 534 |
| "Ovarian Endocrine Functions and Their Relation to Metabolism: A Preliminary Note," by REX F. MATTERS, M.B., B.S., F.R.C.S. | 520 | Nominations and Elections | 536 |
| "Some Points of Clinical Interest Occurring During the Past Year," by EDGAR H. M. STEPHEN, M.B., Ch.M. | 524 | | |
| "A Plea for Physio-Therapeutics," by HUGH L. MURRAY, F.R.C.P., F.R.C.S. | 525 | | |
| REPORTS OF CASES— | | MEDICAL SOCIETIES— | |
| "A Case of Hypospadias," by PERCIVAL PICKERILL, C.B.E., M.D., M.S. | 527 | The Medical Sciences Club of South Australia | 536 |
| REVIEWS— | | OBITUARY— | |
| Clinical Examination | 528 | Harold Edgar Featherstone | 537 |
| Practical Dermatology | 528 | Herbert Joseph Birmingham | 537 |
| The Health of the World | 528 | | |
| LEADING ARTICLES— | | PROCEEDINGS OF THE AUSTRALIAN MEDICAL BOARDS— | |
| A Medical Research Council | 529 | New South Wales | 537 |
| CURRENT COMMENT— | | Queensland | 537 |
| The Treatment of Fractures | 530 | | |
| ABSTRACTS FROM CURRENT MEDICAL LITERATURE— | | BOOKS RECEIVED | 538 |
| Physiology | 532 | DIARY FOR THE MONTH | 538 |
| Biological Chemistry | 533 | MEDICAL APPOINTMENTS | 538 |
| | | MEDICAL APPOINTMENTS VACANT, ETC. | 538 |
| | | MEDICAL APPOINTMENTS: IMPORTANT NOTICE | 538 |
| | | EDITORIAL NOTICES | 538 |

THE TREATMENT OF COMPLICATIONS OF TUBERCULOSIS OF THE SPINE.

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IN a previous paper⁽¹⁾ I have dealt with the subject of early diagnosis and treatment of Pott's disease. The management of such complications as abscess, compression paraplegia and deformity was not discussed. The present paper is in the nature of a plea for the adoption of efficient conservative measures in the treatment of these conditions. I hope to show that operative interference is usually unnecessary and is indeed in most cases harmful.

Abscess.

Cold abscess occurs very frequently as a complication of tuberculous disease of the spine. Often the collection is small and deeply situated and is disclosed only by a skiagram. In practically all cases of tuberculous inflammation there must be a certain amount of caseous material or pus formed. When the amount is large the abscess becomes apparent on clinical examination and is found pointing in one or more of the various well-known situations, for example, on the back, in the iliac fossa or in the thigh.

The diagnosis is not difficult as a rule and will not be discussed. In the past various methods of treatment have been advocated which may be summarized as follows:

1. Leave the abscess alone.
2. Open and drain.
3. Open, evacuate and close by suture.
4. Aspirate as often as may be necessary.

Before stopping to consider each of these procedures in turn, it will be convenient to allude to certain facts which have a distinct bearing on the question of treatment. In the first place, the cold abscess does not materially affect the health of the patient. He may feel and appear perfectly well. There is in other words but little toxæmia or discomfort due to the presence in the body of a cold abscess. On these grounds therefore there is no reason to interfere. Secondly, the advent of pyogenic organisms entirely changes the state of affairs. The abscess is no longer "cold" and must be opened; sinuses form which persist for longer or shorter periods; eventually the patient exhibits signs of long continued sepsis. The end is only too often amyloid disease and death. Secondary infection is to be avoided at all costs. Thirdly, an abscess once emptied tends to refill and may do so again and again after repeated evacuations.

Returning now to a consideration of the four methods of procedure tabled above, it is necessary to mention the second only to dismiss it from the realms of rational treatment. Secondary infection follows as a matter of course the introduction of a drainage tube. The first method demands careful

consideration and is indeed often the best. The pus is *per se* not harmful, therefore it is not essential that it should be evacuated. The abscess may be so deeply situated that aspiration or incision would be difficult or dangerous. In such a case operative interference is contraindicated. Often when the affected spine is placed at rest and general treatment raises the plane of health of the patient, the purulent collection is found to diminish in volume and in time to disappear. On these grounds it may be laid down as a working rule that so long as a cold abscess is small and deeply situated and is not causing discomfort, it may well be left alone. If, in spite of the adoption of efficient general and local orthopaedic treatment, the formation of pus continues and the collection progresses towards the surface, resort must be had to more active measures.

A second working rule may now be enunciated as follows: Pus should never be allowed to progress through the deep fascia into the superficial fascia underlying the skin. So long as there is an intact layer of deep fascia overlying the abscess, there is every chance of preventing spontaneous rupture. The outlook is not so good when the collection becomes subcutaneous.

Suppose that for any of the reasons detailed above it becomes necessary to interfere, the choice then lies between incision followed by suture and aspiration. In a previous paper⁽²⁾ a table was published showing the results obtained by the institution of the first of these methods. Almost always the wound breaks down, a sinus results and the focus becomes secondarily infected. This is a surgical tragedy. Healing is more frequently seen when the incision is planned so as to pass through layers of fascia and muscle as for instance when a psoas abscess is opened by a muscle-splitting incision through the abdominal wall. Disregarding for a moment the glaring fact that sooner or later the wound usually does break down and supposing that in any particular case it heals strongly, there remains the depressing outlook that the abscess will probably refill and may do so a dozen times. It is unlikely that repeated operations will end as happily as the first. These two weighty reasons, namely, that usually the wound breaks down and that if it does not, the purulent collection will probably recur leaving one in a situation worse than before operation, are sufficient to justify the formulation of a third working rule: Never incise a cold abscess.

Aspiration would seem to be the obvious method to employ in order to empty or empty partially a cold abscess. The main objection urged by opponents of this procedure is that in many cases the pus cannot be aspirated through a needle of moderate bore on account of the presence in it of fibrinous flakes which block the canal. This would be a convincing argument, if true; but by the employment of a special technique the fluid content of the abscess may almost invariably be coaxed through a needle of reasonable dimensions. The advantages of the method are very obvious. The

operation may be done under local anaesthesia with a minimum of discomfort for the patient, with practically no trauma to the tissues overlying the pus and it may be repeated as often as may be necessary. Secondary infection following needling is very rare and so is also the formation of a sinus along the needle track. Further, should this latter accident occur, the sinus is more likely to heal than is one which has formed as a result of incision into the abscess. Although aspiration does not usually effect complete emptying of the cavity, this is unimportant, the object being merely to relieve the tension of the contained fluid. In any case further exudation from the lining wall is to be expected. Here it may be stated as a further working rule that when pus threatens to perforate the deep fascia or has already done so, it should be aspirated often enough to keep it quite "slack." There is no hard and fast rule as to how often it may be necessary to interfere.

The difficulties of aspiration vary with the nature of the pus. Sometimes this is a thin turbid fluid, easily withdrawn through a fine needle. It may be more creamy in consistency, but still will flow through a larger needle when suction is applied by means of a syringe. Often enough, however, the presence of numerous shreds of fibrinous material makes this impossible. The syringe must be abandoned and the pus pumped out by the method described below.

After repeated aspirations the pus is seen to change in nature, becoming less and less viscid, until after perhaps fifteen treatments (with or without the injection of modifying fluids, such as Calot's) it may be quite clear and straw coloured. I have several times attained this result.

Technique of Aspiration.

Whilst in many cases the abscess may be evacuated in a few minutes without much trouble, in others the process may be one of extreme tedium. In the most difficult the pus is laboriously coaxed out drop by drop, so that at the end of an hour's work there is perhaps only an ounce or two to show. The contention that it is often impossible to withdraw the pus through a needle of moderate bore is not true, given the necessary skill and endless patience on the part of the surgeon.

In order that success may be obtained it is important that the proper apparatus should be available and that it should be kept in perfect working order. The following kit is essential:

1. A small hypodermic syringe and needle for local anaesthesia.
2. Some 0.5% solution of "Novocain" or similar anaesthetic.
3. One or two twenty cubic centimetre "Record" syringes.
4. Needles perfectly fitting the syringes and ranging from 13 to 18 (British wire gauge), each being about 7.5 centimetres (three inches) in length.
5. A few pieces of piano wire (No. 36 gauge) about 15 centimetres (six inches) in length.

It is necessary to take all precautions to insure perfect asepsis. The skin is carefully prepared, after which the whole operation may be performed through a small hole cut in a sterilized sheet or towel. The skin and subcutaneous tissues at the selected site are anaesthetized and all is ready to introduce the needle. At the first trial one of the larger needles should be chosen and this is thrust into the abscess cavity in accordance with the following principles. The needle should enter through healthy skin some distance to one side of the spot where the pus is pointing and if possible in such a direction that the track left after the operation will trend downwards rather than upwards when the patient is in his usual attitude. This is done in order to lessen the risk of "gravity drainage" along the track. The track from skin to abscess cavity should be five centimetres (two inches) or more in length and should always obliquely traverse skin, subcutaneous fascia, deep fascia and if possible muscle, whilst avoiding important vessels, nerves and so on. The accompanying diagram is drawn to

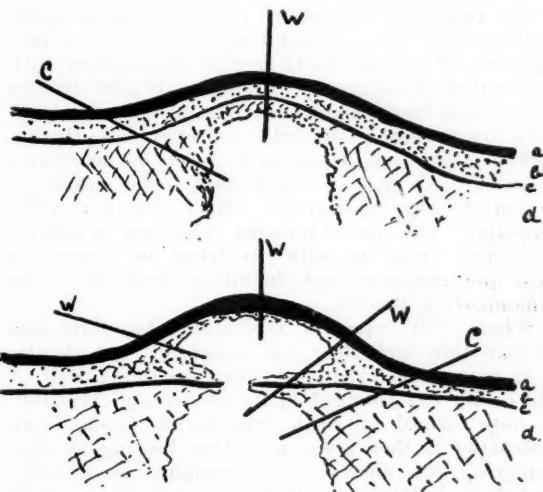


Diagram Showing Correct and Incorrect Methods of Aspirating an Abscess. In the upper figure the pus is still deep to the fascia. In the lower figure the pus has perforated the deep fascia and is subcutaneous. W = the wrong track for the needle to traverse; C = the correct track; a = skin, b = subcutaneous tissue plane, c = deep fascia, d = muscle plane.

represent pictorially some correct and incorrect methods. The needle having been introduced, a syringe is fitted to it and the pus is slowly withdrawn. With luck this may be easy, but often only a few drops will be sucked out. The surgeon then makes himself comfortable and prepares for a long and tiresome sitting. One of the fragments of wire above mentioned is taken and closely wound round one of the finer needles or stylettes for about a dozen turns. On removing the wire it is grasped in forceps by its ends and traction is exerted which has the effect of opening out the coils of the spiral and generally straightening the whole wire. The wire comes to resemble a corkscrew with a spiral portion about five centimetres (two inches) in length and a straight shaft somewhat longer.

The traction should be continued until the spiral may be slipped easily into the needle. To use this little appliance it is slipped spiral first into the needle, then rapidly moved in and out 2·5 centimetres (an inch) or so in the manner of a piston working in a cylinder. At each thrust inwards the end of the spiral should project beyond the end of the needle. Whilst this is going on gentle pressure is exerted on the abscess cavity by an assistant, but only very little force is permissible. *Débris* is caught up by the spiral and formed into a kind of piston. With each stroke of the piston there is a tendency to move the fluid in the needle in the direction of the stroke. By keeping up a gentle pressure in the abscess cavity movement of the liquid in the needle towards the cavity is hindered and on the down stroke a leakage past the piston occurs. At the next upward stroke the piston, aided by the *vis a tergo* already mentioned, sweeps a drop or two of pus out of the needle. Drop by drop quite large amounts may be evacuated.

The Use of Modifying Liquids.

The reader is referred to Calot's "Indispensable Orthopaedics" for a description of the use and preparation of various fluids used in conjunction with the method of aspiration. Undoubtedly good results follow their use in many cases, but on the other hand they are somewhat difficult to prepare aseptically. Simple aspiration, repeated as often as necessary, is so effective that it would seem to be unwise to introduce any manœuvres which are not quite essential. The use of irritant injections is contraindicated when the skin overlying an abscess is thin and reddened and definitely involved in the inflammatory process.

When after repeated aspirations the fluid has become thin and clear and reappears but slowly, it is reasonable to suppose that the lining wall of the cavity has changed in its nature and probably is now formed of clean granulation tissue. An endeavour is then made to induce healing by first emptying the abscess as thoroughly as possible and then applying firm, direct pressure by means of soft pads and bandages. By keeping the opposite walls in close contact for a week or two it is thus hoped to promote union between them, at least over part of the surface.

Compression Paraplegia.

In Pott's disease there is not uncommonly a disturbance of the functions of the spinal cord and associated nerves. The interference may be slight, causing only mild irritation or so severe as to block nerve conduction completely. The picture presented thus varies greatly and differs also with the region of the spine affected. The diagnosis of the level of the lesion is usually accurately established by a neurological examination and a skiagram.

Mechanism of the Compression.

Collapse of the Column. It is remarkable that the most gross collapse may be present with no sign of pressure on the spinal cord. In fact collapse cannot be regarded as one of the causes of com-

pression, except when associated with one of the following conditions.

Pressure of a Loose Fragment of Bone. Sometimes a large portion of the centrum dies *en masse*, probably because its blood supply has been destroyed by tuberculous granulations. When the spine collapses, this sequestrum may be squeezed out posteriorly and exert direct pressure on the meninges and spinal cord. This is a very rare accident.

Pressure of an Abscess. Almost always pus is formed in connexion with the affected site. When the pus gains access to the peridural space and has not free egress elsewhere, it may press on the *dura*, blood vessels of the cord and the cord itself, thus interfering with its functions. This is probably the most frequent cause of pressure paraplegia.

Tuberculous Pachymeningitis. In tuberculous pachymeningitis the *dura mater* is involved in the inflammatory process, becomes swollen and oedematous and constricts the cord or its vessels. This is probably a fairly common occurrence.

Vascular Derangement. When arteries or veins are occluded, as may happen when they are pressed upon or when thrombosis occurs as part of the inflammatory process, there may follow a localized anaemia or oedema in the affected portion of the spinal cord. Probably this process often accompanies the various pathological states above described.

Diagnosis of the Cause.

As each of the conditions detailed above is evidenced by the same symptoms and signs, being those of pressure upon and disturbance of the functions of the spinal cord and its associated nerves, it is obvious that it will be a matter of almost insuperable difficulty to ascertain which particular accident has occurred in any particular case. The more commonly responsible causes are abscess and tuberculous pachymeningitis. A skiagram may disclose the presence of a large sequestrum posteriorly displaced or the history of the onset of nervous phenomena may be of use. In the majority of cases, however, the diagnosis will remain in doubt and it becomes necessary to consider ways and means of treatment in such cases.

Prognosis.

There is a remarkable tendency towards complete recovery when proper conservative methods of treatment are adopted. Often after months, even a year or two, of gross interference with the functions of the spinal cord there follows complete reestablishment of conduction. The following case notes illustrate this point:

CASE I.—A male, aged thirty-one years, a labourer, had been treated for spinal trouble for eight years. Seventeen months before admission to hospital he experienced girdle pains and from then on became rapidly worse. On admission he was desperately ill. He was extremely emaciated and sensation was considerably diminished below the level of the umbilicus. He had no voluntary control of his leg muscles, but suffered from frequent painful flexor spasms affecting the lower limbs. All tendon reflexes were increased and superficial reflexes were not obtained.

Plantar reflexes gave an extensor response (mass reflex). He was unable to pass his urine and the urine was foul and heavily infected. In addition there were two large bed-sores on his back. His spine was grossly deformed, a skiagram showing grave involvement of the third to tenth dorsal vertebrae with extensive collapse.

The patient was treated on a plaster bed, with extension on each leg to combat spasm. For about nine months his bladder was catheterized regularly. After many months improvement was noticed, sensation returning slowly. The bed-sores healed, spasms slowly disappeared. Sphincteric control at length returned. At present, two and a half years after admission, he is practically normal as regards the functioning of the spinal cord and nerves, though still giving extensor plantar responses. Power is good in the legs and properly controlled. Generally the man is very well.

The following case notes serve to demonstrate that recovery may take place after a very long period of grave interference with the functions of the spinal cord. Here almost complete loss of conduction was evident for nearly three years before signs of recovery became manifest.

CASE II.—A boy, aged thirteen years, was admitted to the Austin Hospital on June 24, 1925. He had noticed weakness in his legs late in 1923 and some loss of sphincteric control. At this time he had extensor plantar responses. His condition rapidly became worse until he presented all the signs of an advanced paraplegia from pressure on the spinal cord in the lower cervical region. Bed-sores complicated the picture, but the urine, voided automatically, remained uninfected. On May 6, 1925, laminectomy was performed at another hospital, after which no appreciable improvement could be observed for many months. After a year or so mainly spent lying in a plaster bed, there was definite return of sensation and the boy could voluntarily move one big toe. Progress up to the present has been slow, but now the involuntary spasms have ceased and the patient can raise his feet from the bed. Sensation is almost normal. The urine is still voided automatically, but the boy is conscious of the act. It is probable that progress towards recovery will continue, but to what extent it is not possible to dogmatize.

As regards the effect of the operative treatment instituted in the above case, it would seem that no good resulted. For about one year after operation there was no sign of improvement; nor was such to be expected, as the cause of the pressure, so far as could be ascertained, was a tuberculous pachymeningitis. Probably recovery would have been just as advanced had conservative measures alone been tried.

There is therefore no need to resort to early operation on account of the degree of derangement of the function of the spinal cord. The majority of patients do recover when properly treated without operation, therefore all should be given the chance.

Treatment.

Theoretical Considerations. Were it only a matter of relieving the compression of the spinal cord, laminectomy would undoubtedly be the most effective measure at our disposal. To this procedure, however, there are many serious objections. In the first place the column of the centra is weakened by the tuberculous process and often is practically bisected. To remove the spinous processes and laminae opposite the point of bisection is to leave the portions of the spine above and below connected only at the articular processes. What was before operation a mechanically weak backbone, is after-

wards very much weaker. Secondly, should the pathological process prove to be a pachymeningitis, no good is likely to result from laminectomy, whilst there is a chance of the focus becoming secondarily infected or of the wound surfaces becoming infected by the tubercle bacillus. Thirdly, disseminated tuberculosis sometimes follows operative interference.

There is only one condition which seems to justify laminectomy. This is the case in which a small focus is present in the posterior portion of a centrum with a coincident peridural abscess. Here operation would provide exit for the pus which could not otherwise easily escape, and the spine would not be too weak to permit of removal of the laminae. Walton⁽⁸⁾ has reported such a case. Such a condition is only very rarely encountered, so that it may be laid down as a sound working rule, that operative interference is to be avoided in all cases until proper conservative measures have been tried over a long period and failed.

Usually when in Pott's disease pressure on the spinal cord becomes evident, there is a fairly advanced destruction of one or more centra with more or less collapse or angular deformity of the spine. It would seem that could the deformity be undone, the pressure would be reduced. In practice this is so and all treatment is directed to this end. Various methods are advocated. In some traction is applied in an endeavour to separate the "fragments." Neglecting for a moment the obvious fact that only very little force may be applied, it is evident that most of it is misdirected and that it must fail to achieve its object which is to straighten the spine at the hinge formed by the articulations opposite the lesion. A steel hawser may be subjected to enormous traction in a horizontal plane up to its break-point, but will still sag in the middle. A comparatively small force lifting the hawser at its mid-point easily corrects or over corrects this sagging. So in Pott's disease if the patient is to lie horizontally on his back, the obvious way to correct his sag is to apply force beneath the lesion, acting vertically upwards. The pressure should be applied gently and continuously. Forceful correction of deformity, as advocated many years ago by Calot, is too often attended by serious, sometimes fatal consequences.

Any apparatus which is designed to treat a patient with Pott's disease and paraplegia, should fulfil the following requirements. It must entail no discomfort for the patient, must place his spine at absolute rest, must permit of easy nursing and must not interfere with movement of his limbs, heliotherapy and the general treatment of tuberculosis. In addition provision should be made for the application of gentle pressure to "undo" the deformity.

Practical Considerations. There is in the opinion of the author no other apparatus which so well complies with the above requirements as a plaster bed. For details of the construction and management of the same the reader is referred to a former paper.⁽¹⁾ The presence of bed-sores is not a contraindication to its use, but it becomes necessary to

roll the patient over for inspection and dressing more frequently than in uncomplicated cases. The bed-sore should be quite covered by broad bands of adhesive strapping, perforated here and there to permit of egress of pus. This acts as a support and protection, as does an Unna's stocking used in the treatment of varicose ulcers. Over the strapping is placed a pad of wool to absorb secretions, accommodation for which pad has been provided in the making of the plaster bed. The wool is frequently changed, the strapping only when it becomes slack. The surface of the plaster bed, being coated with shellac, is impervious to moisture and may be washed over to keep it clean. The paralysed lower limbs should be tended as may be necessary in each particular case. Precautions should be taken to avoid foot drop and all joints should be frequently exercised passively to prevent the formation of adhesions. Should there be a tendency to flexor spasms, this must be combated by extension or actual splinting.

Deformity Prevention and Correction.

It is well recognized that in Pott's disease deformity may appear and increase whilst the patient lies on his back in an ordinary bed and Calot states that even a well applied plaster jacket may fail to prevent the development of a gibbus unless special precautions are taken. When the subject lies in a plaster bed constructed as outlined in a previous paper,⁽¹⁾ the onset of such an undesirable complication should be extremely unlikely and in practice it is not observed.

When deformity is already present, what is to be done? The question is not easily answered, there being many factors to consider.

The State of Activity of the Inflammatory Process. When the bacillus tuberculosis is still active, the process of caries is progressing and healing is not in evidence, it is obvious that the spine may become so weakened that it may be moulded or bent at the site of the lesion and that the bending may be such as either to increase or decrease the deformity, the effect depending on the direction of the resultant of all forces acting on the spine. On the other hand, when healing has taken place this pliability is absent. It is only necessary to examine museum specimens of unhealed and healed tuberculosis of the vertebrae to be convinced of the truth of the above statements.

The Age of the Patient. In young children with actively growing bones there is a very good chance of effecting a moulding of the spine by the use of well directed, long continued force. In adults the problem is more difficult.

The Advisability of Attempting to Correct the Deformity. There is no doubt that during the active stage of the disease a gentle corrective force calculated to extend the spine at the site of the lesion acts beneficially, in the same way as does extension in the treatment of hip disease. Absorption of bone appears to progress most rapidly where bone presses on bone. Therefore it would seem to be rational to adopt means to prevent this attrition.

When, however, there is great loss of bony substance, excessive "correction" would possibly separate the adjacent vertebrae and leave a gap between them. While this would presumably help in healing by relieving pressure, there would remain the gap to be filled in in order to reconstitute the weight-bearing central column. It is well recognized that much bone formation is not to be expected in pure tuberculosis of bone. For this reason only the mildest correction should be attempted during the active stage of the disease. Later when healing is well advanced, more force may be used, not with the object of effecting reduction of deformity at the site of the gibbus, but in order to mould the healthy portions of the spine above and below this point.

To effect this pressure pads of wool of generous area are inserted between patient and plaster. First one thickness of wool only is placed in position. Week by week further strips are inserted until in a few months a considerable thickness separates patient from plaster in the region of the summit of the gibbus. The centre of each strip of wool overlies the summit of the deformity. The first should be about 20 centimetres (eight inches) wide and extend right across the back. Each succeeding layer should measure a little less than its predecessor in both directions, so that a bevelled effect is produced, the greatest thickness being in the centre of the pad overlying the gibbus. After some months a fresh plaster bed should be made to fit the changed shape of the back and the process is then continued. The effect of the treatment is observed and recorded by making frequent tracings with the aid of a strip of lead, each tracing being dated.

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⁽¹⁾ Hugh C. Trumble: "Tuberculosis of the Spine: Early Diagnosis and Treatment," THE MEDICAL JOURNAL OF AUSTRALIA, August 21, 1926, page 238.
⁽²⁾ Hugh C. Trumble: "The Treatment of Tuberculous Abscesses," THE MEDICAL JOURNAL OF AUSTRALIA, September 27, 1924, page 322.
⁽³⁾ A. J. Walton: "The Surgery of the Spinal Cord in Peace and War," The Lancet, February 15, 1919, page 243.

OVARIAN ENDOCRINE FUNCTIONS AND THEIR RELATION TO METABOLISM: A PRELIMINARY NOTE.¹

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DURING recent times much discussion has arisen over and considerable interest has been taken in ovarian functions.

The origin of our present research impulse developed in 1906, when Hitschmann and Adler⁽¹⁾ first demonstrated the endometrial changes during the menstrual cycle.

Attention has largely been focused on the ovary as the causative factor in these changes and the

¹ Read at a meeting of the Medical Sciences Club of South Australia on December 2, 1927.

greater number of investigators have centred their work on the *corpus luteum*.

Frank,⁽²⁾ Ancel and Bouin,⁽³⁾ Adler,⁽⁴⁾ Frankel⁽⁵⁾ have laid the foundation of the work to which the present communication is a contribution, based upon work begun under the guidance of Adler some four years since. During this period the most important work has been that of Allen and Doisy⁽⁶⁾ on the ovarian hormone isolated from the *liquor folliculi*.

It has been shown both in humans at operation and in laboratory animals by means of sections that the ovarian cycle coincides with the changes in the endometrium, the ovary itself undergoing anatomical and physiological changes.

Following menstruation the ovary and endometrium both enter on a resting phase. After this the young follicle ripens and advances rapidly to maturation, migrating towards the *tunica albuginea*. Simultaneously and as a result of this ovarian activity the avascular thin endometrium becomes vascular and the glandular tissue thickens and becomes engorged.

With the ripening of the ovarian follicle, cells appear in the *theca interna* which are luteal cells. These cells are polygonal and after their appearance a very considerable endometrial activity ensues, so that when the follicle ruptures and the fertilized ovum passes down the tube into the uterus, a suitable nidus for its implantation is prepared. The follicle becomes distended by the *liquor folliculi* which is secreted by the vascular *theca interna*. It is this liquor which contains the ovarian hormone of Allen and Doisy.

Marshall and Dixon⁽⁷⁾ consider that this hormone activates the posterior pituitary lobe, producing an increase of the pituitary hormone which stimulates the ovarian musculature, thus helping to force the follicle to the ovarian surface and finally aiding in its rupture.

When the follicle ruptures, the *discus proligerus* is cast off and the ovum in the *corona radiata* is expelled. The *corona radiata* contains some luteal type cells which are probably carried with the ovum to the endometrium and it is considered that these cells may develop in the placenta, thus producing a placental luteal function.

When the follicle ruptures, the cavity becomes filled with blood clot and into this luteal cells penetrate rapidly and so produce the *corpus luteum*. Coincident with this the endometrium becomes very thick and glandular, thus developing a decidua.

It is considered that the ovum maintains an influence over the *corpus luteum* which preserves it; this influence is considered to be exerted also by the *corpus luteum* on the endometrium. If, therefore, the ovum is not fertilized, it eventually dies and its control of the *corpus luteum* is lost. The *corpus luteum* then becomes atrophic and in turn fails to exert any influence on the endometrium, so that this is cast off as menstruation or what Whitehouse⁽⁸⁾ calls a sterile abortion.

The present study was made by spaying animals and grafting ovarian tissue or injecting ovarian

extract, the latter being obtained by the methods of Allen and Doisy.⁽⁹⁾

Ovaries were obtained in small quantities and kept on ice until a sufficient number was accumulated. They were then treated as indicated by Ralls, Jordan and Doisy.⁽¹⁰⁾

The ovaries were minced and treated with 95% alcohol for forty-eight hours. After this the proteins were filtered off and extracted with alcohol in a Soxhlet apparatus for eight hours. The filtrate was evaporated to dryness and the extract from the Soxhlet treated similarly in the same dish. The dry residue was taken up with water and centrifuged. The aqueous solution was then alkalinized with sodium hydroxide and extracted several times with ether. The extracts were combined, washed with dilute alkali and water, after which they were distilled. The residue was taken up in 10% alcohol and the cholesterol removed by several extractions of the alcoholic solution with petroleum ether. The hormone is soluble in alcohol, but almost insoluble in petroleum ether, while the reverse holds with cholesterol. This then produces an easy separation. The alcoholic solution was distilled to dryness and the residue taken up in olive oil.

For these investigations the potency of the hormone was tested by injecting into rats. It appeared at once that these injections reduced the condition of the rats from the sleek fatness of the castrated animal and weights were reduced as much as thirty grammes in some cases, probably by the restoration of the sexual entirety.

The extract was standardized according to the methods of Allen and Doisy⁽⁹⁾ using the vaginal smear test of Stockard and Papanicolaou⁽¹¹⁾ as applied to rats by Evans and Long.⁽¹²⁾

The method consisted in taking a vaginal smear at the time of injection of hormone. Further injections were made twelve and twenty-four hours later, while smears were taken twenty-four, thirty-six and forty-eight hours later.

In the original normal smear there are many round cells and few nucleated epithelial cells. The action of the hormone produces general pelvic activity and the squamous epithelium undergoes considerable thickening so that the leucocytes do not enter the vaginal cavity and the surface epithelium degenerates owing to lack of blood supply, so that the second smear contains few leucocytes, many nucleated epithelial cells and few cornified cells. The third smear contains many cornified epithelial cells and this is concurrent with oestrus.

The conception of oestrus adopted in this investigation is that it is due to the action of the follicular hormone as shown by vaginal smears and by the fact that a spayed female will receive the male after injection of this hormone. It is supported also by the fact that during this investigation castrated male rats which have had ovarian grafts and injections of hormone have adopted some female characteristics, even to the extent of making overtures to their non-castrated brothers.

It is considered further that oestrus occurs normally shortly after follicular rupture when the

liquor from the mature follicle is suddenly thrown into the peritoneal cavity there to be quickly absorbed.

Brambell and Parks⁽¹³⁾ consider that oestrus is independent of follicular rupture and in many cases occurs after it. To some extent this supports the foregoing contention.

With the occurrence of oestrus there is a general congestion of the pelvic organs including ovary, uterus and vagina. Stockard and Papanicolou, as also Allen and Doisy, have made sections and shown microphotographs in support of this.

The vaginal epithelium in the diestrus phase is only three or four layers thick and through this leucocytes find their way to the lumen of the vagina. A smear taken at this time contains mainly leucocytes and a few nucleated epithelial cells. The phase of proestrus presents a greatly thickened layer of squamous epithelium up to fifteen layers thick. This prevents leucocytes reaching the lumen and cuts off the blood supply to the most superficial layers, so that a smear taken at this time shows only a few leucocytes, many nucleated epithelium cells and some cornified cells.

With the onset of oestrus the superficial epithelial cells are dead and anuclear and they are shed as cornified cells. The smear at this phase contains mainly non-nucleated cells and a few nucleated epithelial cells.

We have studied the effect of ovarian grafting combined with crude ovarian therapy in a series of six sterile women whose husbands were shown to produce motile spermatozoa. Within six months of the operation four had menstruated normally for the first time and two of these had conceived.

Goto⁽¹⁴⁾ united animals in pairs by parabiosis. Of 268 pairs 78 pairs lived for more than one month. Removal of the ovaries of one of a pair was followed by hypertrophy in those of the parabiotic sister. When oestrus occurred in the non-castrated animal, her non-sexual sister exhibited the same signs.

Assuming that the ovarian function (either follicular or luteal) influences the breasts, it is interesting to recall the famous Blazek twins of Brasch and Schauta. These were pygopagus twins, that is, united along the region of the upper parts of the thighs. The twins were female and one gave birth to a child. The point of interest is that the child could be suckled equally well by its mother or the nulliparous aunt, thus indicating some hormonic influence.

Pratt and Allen⁽¹⁵⁾ produced uterine growth in spayed monkeys by injection of follicular hormone. When the hormone was withdrawn, however, menstruation ensued.

Mancher and Rogers⁽¹⁶⁾ found that ovarian extract given to women at artificial menopause produced relief of symptoms.

Crainianu⁽¹⁷⁾ found a lowering of sympathetic tone after removal of uterus and ovaries.

Küstner⁽¹⁸⁾ found that castration was usually followed by headache, chills *et cetera*, but he found none of these symptoms after simple hysterectomy. Following this line of thought, Mansfield⁽¹⁹⁾

undertook autoplasty transplantation of the ovary in fifty cases following oophorectomy where the uterus was not removed. Without exception the results were excellent. In another series the uterus was removed; the results, however, were unsatisfactory. Mansfield pointed out that there must be some interaction between uterus and ovaries.

Adler considered that the internal secretion of the ovary together with that of the parathyroid and pancreas cooperate, thus forming an endocrine group and that this group is balanced by an antagonist group composed of the thyroid, pituitary and suprarenal. Collip⁽²⁰⁾ considers that the former group stimulates the sympathetic, while the parasympathetic is stimulated by the latter. Normally a balance is maintained.

For the purpose of these investigations a series of cases was taken in which hot flushes, increased pulse rate and other symptoms and signs of the menopause were pronounced. These states were far more marked in cases of post-operative menopause than after the normal climacteric. It is here considered that this results from hyperactivity of the suprarenal and thyroid when ovarian resistance is suddenly removed. When the menopause occurs normally and slowly, these states are far less pronounced, probably because the gradual cessation of ovarian activity permits a new balance to result.

The investigations here considered have included a careful study of the human menstrual cycle and women have received injections of adrenalin at different times in the cycle, the blood calcium content being estimated simultaneously.

The results with adrenalin varied, but it was noted that in the late menstrual or post-menstrual phase the headaches and tendency to produce flushes were greatest. In the premenstrual condition the effect of adrenalin was in most cases almost nil. In two patients who received adrenalin immediately before the expected onset of menstruation, the period was delayed. In three patients who had injections during menstruation, there was a sudden cessation of the menstrual flow; in one case it returned in two days, in another in five days and in the third patient there was no further flow until the ensuing month.

This information is not offered as being true in every case, as the number of cases is so far very small.

In support of hypoovarianism during pregnancy and in accordance with the gland group theory is the fact that during pregnancy injections of suprarenal extract produce glycosuria while the same amount in non-pregnant women has no such effect. As further evidence may be offered the well known fact that adrenalin dropped into the conjunctiva is productive of pupillary dilatation both in pregnancy and disease of the pancreas. The same amount has no effect in normal woman. This would indicate a lack of balance in the pancreas or ovary towards adrenalin.

Still working on the group theory, a group of thirty patients were examined for their blood calcium content in the various phases of menstrua-

tion. Blair Bell⁽²¹⁾ first pointed out the calcium variation of the blood during menstruation and he attempted to correlate blood calcium with ovarian function. He regarded the excretion of much calcium in menstrual blood as comparable with the egg laying of birds.

Appended is a table illustrating the changes in the blood calcium content during the menstrual cycle. A rough average shows that in the pre-menstrual phase over a period of seven days the blood calcium

and removal of the placenta. If this is not done, luteal tissue probably remains in the placenta and maintains the calcium mobilization. The theory which is offered for this is that when the ovum and *corona radiata* leave the follicle, there are luteal cells carried with it and these regenerate and become active in the placenta which takes on luteal functions after about three months.

Whitehouse⁽⁸⁾ and others have indicated their experimental results on the *corpus luteum* and it is here considered that it is this body or its homologue in the placental tissue which exerts an influence on the metabolic processes; especially may this be in regard to calcium metabolism. Laying down of calcium as a regular thing ceases at puberty. The cessation of the laying down of calcium at puberty may be the reason for the short stature of the Hindu who attains puberty at a much earlier age than the long boned Norwegian. It is felt that this metabolism depends on the ovary, parathyreoid and probably the anterior pituitary lobe which has been shown by P. E. Smith⁽²³⁾ to have considerable interaction with the ovary.

References.

TABLE SHOWING CHANGES IN BLOOD CALCIUM CONTENT DURING THE MENSTRUAL CYCLE.

| Number. | Pre-menstrual Group. ¹ | | Menstrual Group. ² | | Post-menstrual Group. ³ | |
|---------|-----------------------------------|------------------------------------------------------|-------------------------------|------------------------------------------------------|-------------------------------------------|------------------------------------------------------|
| | Number of Days Before Period. | Milligrams of Calcium per Hundred Cubic Centimetres. | Number of Days During Period. | Milligrams of Calcium per Hundred Cubic Centimetres. | Number of Days After Cessation of Period. | Milligrams of Calcium per Hundred Cubic Centimetres. |
| 1 | 4 | 14 | 3 | 10.35 | 10 | 11.2 |
| 2 | 1 | 14 | 2 | 10.1 | 2 | 9.5 |
| 3 | 2 | 17.2 | — | — | 1 | 10.2 |
| 4 | 5 | 10.2 | 5 | 10.5 | — | — |
| 5 | 3 | 12.1 | 2 | 10.6 | 7 | 10.4 |
| 6 | — | — | 3 | 12.4 | — | — |
| 7 | — | — | 2 | 9.4 | 14 | 10.9 |
| 8 | — | — | — | — | 2 | 10 |
| 9 | — | — | — | — | 1 | 10.5 |
| 10 | 15 | 11.8 | — | — | — | — |
| 11 | — | — | 3 | 12.1 | 3 | 10.5 |
| 12 | — | — | — | — | 2 | 10.3 |
| 13 | 6 | 10 | — | — | — | — |
| 14 | 7 | 11.4 | 2 | 13.3 | — | — |
| 15 | 1 | 11.3 | — | — | 14 | 10.9 |
| 16 | — | — | — | — | 7 | 9.5 |
| 17 | 7 | 11.6 | — | — | — | — |
| 18 | — | — | 3 | 12.1 | — | — |
| 19 | — | — | — | — | 3 | 8.9 |
| 20 | — | — | — | — | 4 | 10.2 |
| 21 | 7 | 10 | 3 | 11.3 | 4 | 9.2 |
| 22 | — | — | — | — | 2 | 10.1 |
| 23 | 4 | 10.5 | — | — | — | — |
| 24 | — | — | — | — | 7 | 9 |
| 25 | — | — | 1 | 9.5 | — | — |

¹ Average : five days pre-menstrual blood = 12.0 milligrams of calcium per hundred cubic centimetres.

² Average : three days menstrual blood = 10.9 milligrams of calcium per hundred cubic centimetres.

³ Average : five days after end of menstruation = 10.5 milligrams of calcium per hundred cubic centimetres.

Each number represents a patient. Some have had blood taken in different periods but in same stage, for example, five in menstrual phase. In the post-menstrual group it is to be noted that the longer after menstruation, the greater the blood calcium as an average.

was 12.0 milligrams *per centum*. During the six days of the menstrual phase the blood calcium fell to 10.9 milligrams *per centum* and in the post-menstrual phase during the remaining days in the twenty-eight day cycle the blood calcium was 10.5 milligrams *per centum*.

This result is in agreement with the work of Mirvish and Bosman⁽²²⁾ who found that injections of ovarian hormone into rabbits produced a lowering of the blood calcium.

It is assumed that the blood calcium is elevated by the *corpus luteum* for foetal requirements, while the effect of the follicular hormone is progressive with the ripening of the follicle.

The classical treatment of osteomalacia (where the calcium is withdrawn from the tissues and circulated in the blood stream) is oophorectomy which removes the luteal influence in the ovary. In most cases that is combined with therapeutic abortion

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(28) H. Küstner: "Untersuchungen über die innersekretorischen Veränderungen nach Uterusexstirpation, Operativer Kastration, Röntgenkastration und im normalem Klimakterium," *Monatsschrift für Geburtshilfe und Gynäkologie*, 1925, Band LXX, Seite 285.

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SOME POINTS OF CLINICAL INTEREST OCCURRING DURING THE PAST YEAR.¹

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In selecting a subject for an address suitable for delivery to the Section of Paediatrics, I realized that it was essential that what I put before you should have the support of reports from the Pathological Department, temperature charts and the clinical histories faithfully kept by the resident medical staff. The points I shall mention, are not derived from favourite medical romances or superstitions of mine, but are the outcome of the examination of the histories of the 394 patients admitted to the beds under my care during the past year. I sincerely hope that parts anyhow will prove of some interest and utility. I must first acknowledge with much gratitude a physician's indebtedness to the Pathological Department for the assistance in diagnosis, prognosis and treatment that is derived from its staff.

Respiratory System.

Sixteen per centum of the patients suffered from lobar pneumonia. Two patients had both bases involved, twenty-seven the right base, seventeen the left base, ten the right apex, six the left apex. The period of pyrexia in the great majority of these patients was ten days. I have seen it stated on several occasions that bronchopneumonia is a much more common disease in childhood than lobar pneumonia. My experience does not agree with this.

¹ The Chairman's retiring address, delivered at the Annual Meeting of the Section of Paediatrics of the New South Wales Branch of the British Medical Association on March 23, 1928.

as but 10% of the patients suffered from bronchopneumonia, thirty-nine in all. The bronchopneumonia complicated an existing pertussis in seventeen of these thirty-nine patients. One in every three of the patients with pertussis admitted to my beds suffered from a complicating bronchopneumonia.

Frænæl Ulcers.

It is commonly stated that the ulceration of the *frænum linguae*, seen in pertussis, is due to trauma from the teeth. This was not true in the case of an infant five weeks old, who had a definite ulcer though no teeth had yet erupted.

The Central Nervous System.

There were fourteen cases of meningitis, nine were tuberculous. Eight of the nine children gave a positive response to the von Pirquet test. Eye symptoms appeared earlier than in the other forms of meningitis and there was less pronounced rigidity until the later stages of the illness. On analysis of the cerebro-spinal fluid, the chlorides were reduced in half the number. The other forms of meningitis were pneumococcal, meningococcal and streptococcal in order of frequency.

Kernig's Sign.

In the case of one patient with meningitis whose cerebro-spinal fluid escaped under remarkably increased pressure when lumbar puncture was performed, a Kernig's sign was absent. It had previously been my experience that when the cerebro-spinal fluid is under increased pressure, Kernig's sign is present. I now believe that when the pressure is increased beyond certain limits, Kernig's sign may be suppressed. In another patient with meningitis whose blood gave a positive response to the Wassermann test, the cerebro-spinal fluid failed to yield a reaction. An examination of the deposit revealed the presence of tubercle bacilli and the provisional diagnosis was upheld. It is to be expected that the cerebro-spinal fluid will give a reaction only when the central nervous system is specifically affected.

Enteric Fever.

In the nine cases of enteric fever the popular date of return to a normal temperature was thirty-two days after the onset of the disease. Seven patients manifested a leucopenia. The Widal test yielded a positive result in four.

Pink Disease.

There was a leucocytosis in all but one of my eight patients with pink disease. There were no features with which you are not familiar.

Thrombocytopenia.

The association of thrombocytopenia with some cases of purpura is worthy of note and of a somewhat detailed description. In the last few months I have had three patients suffering from purpura in whom there was a deficiency of blood platelets. One was suffering from a very mild form of the disease, one from a comparatively mild and one

from a very severe form. It is some satisfaction to have an explanation of the occurrence of purpura, if only in a certain number of instances. In Piney's recent book, "Advances in Haematology," an account of Werlhof's disease is given. In it occur: (i) haemorrhages which occur periodically into or from the tissues though none may be superficial; (ii) increased bleeding time, the rate and degree of retraction of the blood clot being defective and (iii) splenomegaly which may sometimes be present.

The number of blood platelets present in the blood waxes and wanes and when the number falls very low, the manifestations occur. These may be so severe that chronic anaemia is produced or sloughing takes place.

Treatment.

Transfusion of citrated blood may provide sufficient platelets to tide over the crisis and perhaps by introducing foreign protein into the circulation may stimulate the blood-forming organs to generate blood platelets rapidly. Many consider the spleen to blame for the condition and advise the removal of this "great thrombolytic organ." After splenectomy the blood platelets may rise to a number far in excess of normal and in persistent cases of recurrent haemorrhage operation is probably advisable. On the other hand, there may be no increase or an increase of but brief duration. As the deficiency may be a very transitory phase or recur only at long intervals, recourse to splenectomy should be a very rare necessity. The intramuscular injection of sterile milk, repeated in increasing doses for several days in succession, often hastens the generation of blood platelets and when it fails conspicuously, splenectomy has been found to fail also. I have quoted from Piney at some length, but I think you will agree the subject merits such a step.

Paramyoclonus Multiplex.

Dr. A. W. Campbell made me acquainted with the euphonious complaint known as *paramyoclonus multiplex* and I shall proceed to describe the condition of my patient who was the subject of it. You will find a brief description of it in H. Campbell Thomson's "Diseases of the Nervous System." This boy had recently arrived from England and had had attacks for seven years. The first attack took place at the age of three years, shortly after the operation of herniotomy. He was twice admitted to the hospital here and the last attack was the most severe he had experienced. Intervals of six to twelve weeks occurred between attacks. Every few seconds his entire body (trunk and limbs) twitched convulsively in a series of movements suggestive of repeated electric shocks. He could not speak, though he was quite conscious. Sometimes he has been able to speak and sometimes, according to the history of previous attacks, the movements ceased while he was speaking. There was no incontinence of urine or faeces and no biting of the tongue. The heart rate varied with the movements. The attack I describe lasted six hours. The reflexes were normal.

General Account.

Thomson says the reflexes are usually exaggerated. The disease is sometimes associated with epilepsy. "Probably the seat of the disease is situated in the cerebral cortex."

Family History.

Sometimes several members of the same family suffer from the disease.

Prognosis.

The symptoms often persist, sometimes not.

Treatment.

The administration of bromides, if epilepsy be present, is recommended and sedatives such as hyoscyamus are given, if the spasms are very violent. In an effort to "give it a name" the medical attendant may think of chorea. It is therefore an advantage to know of the existence of this polysyllabic and distressing complaint.

A PLEA FOR PHYSIO-THERAPEUTICS.¹

By HUGH L. MURRAY, F.R.C.P., F.R.C.S. (Edinburgh),
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Melbourne.

In all departments of medicine the experience of the war has caused a great advance, but in no section has it been greater than in physio-therapeutics. This form of treatment, established for the cure of the wounded, is still continued in special departments by the Repatriation Department and no hospital today would be considered completely equipped, if it did not include physiotherapy in its armamentarium.

Treatment by physical agents, heat, light both natural and artificial, electricity, massage and movement, exercises, baths, mechanical apparatus *et cetera* has been used in some form for all time, but until recent years it has not been specially taken up by the medical profession and carried out in a scientific spirit of investigation. Even now it is mostly carried on outside the profession. The experience of athletes in training and of soldiers in preparation has shown how swiftly both mind and body respond to physical agents. Hard exercise and exposure to the weather in the course of military training have in a few months transformed delicate and languid youths into strong, reliable, vigorous men capable of withstanding the severest bodily and mental strain. Also later on in the actual field, these same men, reduced to an extremity of fatigue and exhaustion have regained their elasticity and vigour in a few hours by the use of hot baths and a brisk rubbing down and since life itself depends upon these physical agencies, it becomes the duty of those who are charged with the health of the community, to insure ample and sufficient access to these sources of energy to every

¹ Read at a meeting of the Section of Physio-therapy at the Victorian Branch of the British Medical Association on April 5, 1928.

individual. Passing across the hazy line that divides preventive from curative medicine, it is admitted by all thoughtful people that these same great and fundamental remedies are not yet employed and valued as their powerful action on the body is understood. They now form a chief part in the recognized treatment of all forms of tuberculosis, of fevers and of many chronic diseases—the influence of fresh air, the rays of the sun, of heat, of cold, of light and of movement in wind and water.

Little consideration is needed to show that physical agents, so potent in their influence on the human body in health and development, must have also an equally powerful operation and efficacy in the treatment of disease. Physical forces are closely correlated. It is doubtful if they ever act singly upon the human body. In the sun rays light is combined with heat and other invisible radiation extending beyond the violet and the red. So with artificial radiation baths. No doubt as scientific investigation progresses, the different kinds of rays will be disentangled and their medical value and use determined.

Recently it has been discovered that the ultra-violet are the most potent in healing effects and that ordinary glass, transparent to light and to a less extent to the heat rays, completely cuts off the ultra-violet. At the present time efforts are being made and with success to produce a substance which, like glass, will allow light and heat rays to pass and also allow ultra-violet. In *The British Medical Journal* of September 24, 1927, is an article detailing the success achieved in this direction, so that we will probably find hospitals and even bedrooms of the future equipped with windows containing a substitute for glass and possessing this property.

In the case of baths also the effects of heat and cold are combined with those of moisture and pressure, of movement and of the gases and salts contained in the water besides those belonging to its physical qualities such as electrical potential and radio-activity. Again, it is obvious that friction and movements are accompanied by heat and electrical currents. The very movements of our hearts produce currents as evidenced by the electrocardiograph. Even the mental processes in the discharge of an impulse produce definite electrical cutaneous currents, as proved by Tarchanoff's experiments. He showed that if we put an electrode on a part of the skin that is rich in sweat glands such as the palm of the hand and another on a part not moist at all such as the outer side of the forearm or leg and put them into circuit with a delicate galvanometer, no current will be observed while the patient is tranquil and at rest in both body and mind. But if he be tickled or stroked with a brush (it matters not where) a cutaneous current will develop in two to three seconds passing in the external circuit from the dry part to the moist. The palm therefore becomes electronegative to the outer surface of the forearm. Mental emotion and intellectual exercises produce the same effects as do also muscular movements, however slight or far removed. The effects of cool fresh air in tuberculosis are well known

and also the curative influence of heat and light both artificial and natural. In this regard we learn that the Finsen Institute at Copenhagen is getting distinctly better results from artificial light treatment than they are getting at the open air treatment sanatoria of Switzerland.

These facts signify unmistakably that there are laws governing the reaction of the body to light, heat and cold and by virtue of these laws reactions may be produced in disease which increase the *vis medicatrix naturae*, raise the resistance of the tissues to invasion, check the extension of disease and favour the natural processes of cure.

In 1900 when I was appointed Honorary Medical Electrician to the Melbourne Hospital, I created the Electrical Department. At first, of course, there was not much work. I was able to deal with it in an hour or so on two afternoons a week. It consisted principally in taking out electrical reactions in nerve cases and the treatment of old chronic paralytic patients and those with joint diseases by electrical stimulation. The Massage Department consisted of the late Mr. T. Hall who was able to do the work without difficulty single handed. When the present physio-therapeutic department was built in 1922, I was appointed in charge of the whole department. As evidence of the extraordinary progress made in treatment by physical agents and of the change in the opinion of the medical staff as to their usefulness, I may say that the attendances in the department last year (1927) averaged about three hundred daily—the medical electrical averaging between seventy and eighty daily and the massage, heat and light treatment the balance.

We have two whole-time and twelve half-time electricians and four whole-time and twenty half-time masseuses. The diseases treated now embrace almost everything from acute pneumonia by diathermy to the removal of naevi by violet rays. It can fairly be said that the work done by the staff in physio-therapy at The Austin Hospital has changed the whole outlook of that hospital. For many years after it was opened it was known as The Austin Hospital for "Incurables." Owing to the fact that a number of these so-called incurable patients were as a result of treatment discharged cured, it became necessary to change the name of the hospital which is now called The Austin Hospital for Chronic Diseases.

I have been consulted by the Charities Board as to the organization of the Physio-therapeutic Department in the new hospital to be built in Melbourne. I have planned it on a scale to deal with twice the amount of work we are at present doing at the Melbourne Hospital. I have suggested a separate block of three stories and containing a massage department, Tallerman and Leucodescent lamp department, electrical department including diathermic treatment, a bathing department, light department both natural and artificial, and a gymnasium containing certain equipment and apparatus for special treatment such as Frenkel's exercises for locomotor ataxia and reeducation of muscle in poliomyelitis. I believe, if it is carried

out as I have suggested, we shall have the best department of the kind in the southern hemisphere.

I look forward to the new department of the new hospital attached to the University creating a body of doctrine that will in the future determine the actions and uses of the physical agents as remedies. What is needed is a critical study of the subject and this is done best of all *pari passu* with their practical application. Clinical study is the most accessible and fruitful field of research. Observation by the trained observer, aided by instruments of precision, will guide the course of treatment and build up the science upon which the art of treatment depends. It will be found, too, that these remedies are powerful in assistance in psychological treatment. Persuasion, suggestion, the influence of one personality over another, often depend for their efficacy upon associated physical treatment which has a whole series of powerful impressions at its command and which can often act through the body upon the mind. The psychical factor in illness is likely to play a larger, not a smaller part in the future; the modern demands of civilization have developed so rapidly that they have outstripped man's power of adaptation and strains and conflicts will require more careful consideration. The increase of illness due to "exhaustion" states illustrates that the best healing of the mind is that which is not obtrusive and still less exclusive, but rather accompanies a sound physical treatment. The sick cannot get away from the feeling that what is physical is real and something they cannot help, whereas what is psychical is unreal and something they can help. I plead, therefore, that we should take a broad and comprehensive view of treatment, that physical and psychical healing should not be divorced from each other and that all forms of treatment should be coordinated and directed, though not necessarily executed by the doctor and based on sound and accurate diagnosis. How much of the way one walks by sight and how far by faith is often after all a secondary matter, if the journey be successfully accomplished.

Reports of Cases.

A CASE OF HYPOSPADIAS.

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Sydney.

THE case recorded here is interesting in so far as it demonstrates the advantages of strict adherence to the fundamental principles of plastic surgery, when dealing with this somewhat difficult condition. The principles to which I allude are: (i) Absence of raw areas; (ii) absence of tension; (iii) accuracy of adaptation; (iv) asepsis.

These conditions naturally, are not easy to fulfil when dealing with a condition like hypospadias, especially an extensive case such as the one recorded here.

The described operations of Thiersch and Szymenowski both introduce the element of tension in a very pronounced degree. This is particularly undesirable when dealing with erectile tissue, since it courts almost certain failure, with the consequent exposure of raw surfaces, thence sup-



FIGURE I.

puration and thereafter cicatricial contraction which, of course, is not only inimical to further operations, but destroys function.

There is an operation described by Beck which is better, in that, after forming a floor for the urethra by means of long lateral skin flaps, he covers in all the raw surfaces thus made by a flap from the scrotum. This, on paper at least, looks good, but it has three very practical disadvantages: First, it means nearly a 180° swing for the second flap, which is rather much for its blood supply. Secondly, the flap is hair bearing and consequently the whole of the under surface of the penis will grow hairs right up to the glans. Thirdly, it leaves a triangular space to be filled at the base of the flap—always a difficult shaped area to close and here particularly a potent source for sinus establishment and consequent leakage of urine.

The present patient was a young man, aged twenty-six years. He had no floor to the penile urethra at all and he voided urine through a sinus in the scrotum. He stated that he had had over twenty previous operations. When he was referred to me he had down each side of the "half" urethra numerous fringes (like the chaparals on a cowboy's leg) resulting from broken down previous flaps,

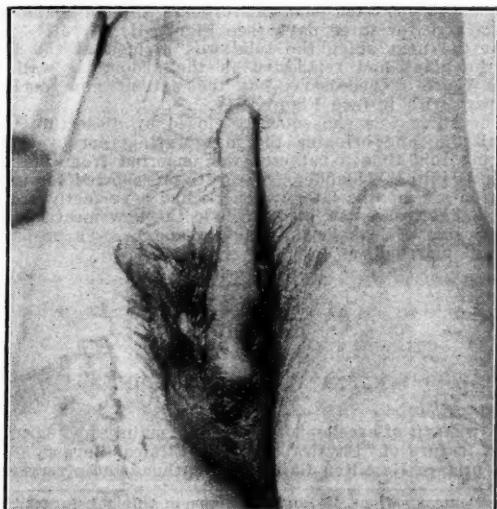


FIGURE II.



FIGURE III.

which had been made in an endeavour to close the urethra. I am not sure, but I think that Beck's operation had also been tried (see Figure I).

It was obvious that tissue would have to be obtained from a distance to repair the defect, so I fashioned a tube graft on the right side of the abdominal wall. This was swung down in two stages and the lower end was opened out to form an outer covering for the floor of the urethra. The inner lining was obtained from the fringes down each side, each fringe being split open and turned inwards and all sutured together with fine cat-gut—a very lengthy and tedious proceeding. A catheter was introduced into the bladder through the old sinus and kept there for three days (see Figure II).

At the next stage the tube was divided at the level of the glans and reinserted in the abdominal wall for future use if necessary, but the patient now declines to part with it (see Figure III).

The sinus was subsequently closed by dissecting up a small flap and bringing the margins together over this. During this time a catheter was inserted from the new meatus into the bladder. The patient reported for examination six months later, when he had a perfectly normal organ. He passes all his urine *via* the new meatus, there is no sign of leakage or stricture and he was proposing to get married.

Reviews.

CLINICAL EXAMINATION.

A WEALTH of excellent illustrations, mainly photographic, is a feature of "Physical Signs in Clinical Surgery."¹ In the preface Hamilton Bailey, the author, states very truly

¹ "Demonstrations of Physical Signs in Clinical Surgery," by Hamilton Bailey, F.R.C.S. (England); 1927. Bristol: John Wright and Sons, Limited. Royal 8vo., pp. 232, with illustrations. Price: 21s. net.

that "the history, and physical methods of examination, must always remain the main channels by which a diagnosis is made" and in a short introductory chapter he sets out the sequence of processes, mental and physical, by which a diagnosis is logically reached. Whilst it is with physical methods of examination in their correct and intelligent application that Mr. Hamilton Bailey mainly concerns himself, he does not entirely neglect to outline certain aspects of differential diagnosis.

The whole book is redolent of the bedside and bespeaks the careful, accurate and experienced observer. Due regard is shown for established authority and classical methods, but no hesitation is shown in giving space to a description of certain other signs and methods which have proved of value to the writer.

One or two inaccuracies appear. Thus, on page 11 the quality of the crepitus of gas gangrene is described as being coarser than that of surgical emphysema and on page 201 Tinel's sign of nerve regeneration is incorrectly given. No mention is made of the great value of a light anæsthesia in the diagnosis of acute intussusception.

Withal, the book is to be highly commended not only to the student but to the surgical instructor.

PRACTICAL DERMATOLOGY.

"A PRACTICAL TREATISE ON DISEASES OF THE SKIN," by Oliver S. Ormsby, Clinical Professor and Chairman of the Department of Dermatology, Rush Medical College of the University of Chicago, is to hand.¹ This is the third edition and, compared with the last, it has been considerably reconstructed and enlarged. It has thus been possible to discuss many new diseases and to bring the book thoroughly up to date. We have nothing but praise for the manner in which the author has accomplished this. The book is well written, well illustrated and very comprehensive for a single volume. Differential diagnosis and the newest methods of treatment are discussed in a clear and concise manner. The student will find it of value as a reference, though his limited time to devote to special departments may make him seek a text book not so far reaching. It is to be recommended to the general practitioner and also to the specialist who will discover in its pages much to interest him.

THE HEALTH OF THE WORLD.

THE extent to which the health of any one country is dependent upon the hygienic condition in foreign countries is emphasized in C. W. Hutt's "International Hygiene."² The international agreements arrived at and the measures taken to prevent the spread of infectious disease from country to country, to control venereal disease, to promote industrial hygiene, to safeguard the health of seamen, to further the hygiene of emigration and immigration, to protect the food supply and to combat the problem of drug addiction, are admirably summarized. The activities of the principal voluntary health organizations, notably the League of the Red Cross Societies, are briefly described and an account is given of the work of the League of Nations Health Organization.

This book is recommended to all persons concerned in public health administration, as it indicates the extent of Australia's committal to the various international health agreements and suggests the measures which may be taken for the improvement of the health of the world as a whole.

¹ "A Practical Treatise on Diseases of the Skin for the use of Students and Practitioners," by Oliver S. Ormsby, M.D.; Third Edition, thoroughly revised; 1927. Philadelphia: Lea and Febiger. Royal 8vo., pp. 1277, with illustrations.

² "International Hygiene," by C. W. Hutt, M.A., M.D., D.P.H.; 1927. London: Methuen and Company, Limited. Royal 8vo., pp. 261. Price: 10s. 6d. net.

The Medical Journal of Australia

SATURDAY, APRIL 28, 1928.

A Medical Research Council.

DURING the past six months and even longer the Branches of the British Medical Association in Australia have been asked to put forward a suggestion to the Federal Committee that a medical research council should be established at an early date and that this council should be composed mainly of research workers and be independent of the public service regulations. The fact that the suggestion was brought almost simultaneously to all the Branches and the further fact that no supporting argument was presented to justify the adoption of a policy were regarded by some of the Branches as significant. Some vague rumours seem to have been started concerning an alleged interference with research workers by government departments. No definite instances were cited and for a time the proposal was not taken seriously. At the meeting of the Federal Committee the Queensland Branch submitted a motion to the above effect. The proposition was put forward that research workers should not be hampered in their work by political influence. No one could fail to endorse this proposition, but it is unusual to enunciate a platitude as a principle and to approach a government with the request that effect be given to a suggestion based on the principle, unless evidence is available that the practice or the intention of the government is at variance with the principle. The Federal Committee was reminded by its Chairman of the recommendation of the Royal Commission on Health in regard to a health research council. The Royal Commissioners have put forward a scheme for the establishment of a research council with a yearly income from the Commonwealth Government of £30,000. The council, it was thought, should consist of nine persons, of whom one should be a representative of the Government, one a

nominee of the National Research Council and seven medical practitioners, the Director-General of Health, representatives of the Faculties of Medicine of the Universities of Sydney, Melbourne and Adelaide and three representatives of the medical profession, nominated by the Federal Committee. It is quite clear that if the recommendation of the Royal Commission on Health were adopted, the council would not be subject to political control or to any public service restrictions. No ministerial announcement has been made suggesting that it was the intention of the Commonwealth Government to create a research council in such a manner that there would be any risk of dictation by political considerations. The Federal Committee therefore modified the proposition and determined to ask the Federal Government to carry into effect the recommendations of the Royal Commission at an early date. It appended to this request a platitude that the council should be free from the public service regulations.

It is not clear from the report of the Royal Commission on Health how the proposed council would exercise its functions. It is set out that the object of the council would be to promote research. Its duties would include the control and allocation of money, the provision of facilities for research workers in existing laboratories, the assistance of individuals engaged in investigations, the coordination of the activities of research workers and the advising of persons in regard to the direction in which research is indicated.

At the present time there are several organizations, semi-private institutions and private funds concerned with medical research. It has been pointed out in these columns from time to time that there is little inducement in Australia for medical practitioners to devote their energies to research. In the first place the professors and teachers in the medical schools with but few exceptions have no leisure to prosecute research. The spirit of inquiry is not inculcated into the minds of medical students; no facilities are provided for students to take part in investigations and in consequence the irresistible attraction of research work is almost unknown among students. In the second place research work does not pay. Medical prac-

titioners have to be altruistic enthusiasts to devote their lives to the search for knowledge. If research work is to be developed in the Commonwealth, the University authorities will have to lead the way by introducing some radical changes in the medical schools. The duties of the professors and teachers will have to include research as well as teaching and additional remuneration will have to be provided. Original thought and a spirit of investigation in students will have to be encouraged and examiners will have to recognize that orthodox medicine may be faulty and that an ingenious reply by a candidate, provided that it is based on an understanding of the main problems, should be accepted, even if it is at variance with the pet views of the examiner.

The second essential is the provision of sufficient sums of money to render it possible for adequate salaries to be paid to trained and competent investigators. It would presumably be a function of the medical research council to subsidize research institutions for this purpose. The relations of the research council and the research institutions would have to be defined. If the receipt of a subsidy were to deprive the institution of its independence and right to govern its own affairs, the price might be too great to pay. In principle coordination of effort is eminently desirable, but its success in practice must depend to a large extent on the personnel of the council. The Medical Research Council in Great Britain has not been entirely successful as a coordinating body and at times the methods adopted by it or by its committees have left much to be desired.

It is to be hoped, however, that the Federal Government will accede to the request of the Federal Committee. The allocation of a substantial sum of money, the appointment of a research council with representatives of the three faculties of medicine, thus placing the responsibility on the universities to carry out their part in the scheme and the general recognition of the importance of research are so important that the adoption of the recommendation of the Royal Commission would be a very great event in the history of medicine in Australia.

Current Comment.

THE TREATMENT OF FRACTURES.

ANY aspect of the treatment of fractures may be considered from several points of view. These include that of the medical practitioner, that of the patient and possibly that of an insurance company which is called upon to pay compensation to the injured person. The medical practitioner has in the first place to consider the character of the lesion and has to determine whether it is one which he is qualified to treat. Fractures occur most frequently among those who have to gain their livelihood by their own exertions, and the medical practitioner naturally determines to do all in his power to shorten the period of disability. He wants to see the injured worker return to work at an early date, not only for the sake of the worker himself, but also for those who are dependent upon him. Most medical practitioners realize, moreover, that a bad result from a fracture is the worst possible advertisement that they can have, especially if they are living in a small community such as a country town. It is the sort of advertisement which is perpetual and which is apt to obtrude itself on all possible occasions. Australia is a place of great distances and a medical practitioner in the backblocks is called upon to treat patients suffering from disabilities of all kinds. The question which must be settled, is whether the patient is to be treated throughout by the medical practitioner who first sees him, or whether he should be referred to a surgeon who has made a special study of fractures and of the methods of dealing with them. The time is close at hand when distance alone will be no bar to the transference of a patient to the care of a surgeon specialist. It is a matter of common experience that when people have learned to have confidence in a medical attendant they think that he is capable of treating them throughout any illness or in any eventuality. The confidence of a patient is of assistance to the medical attendant, it helps to improve his results, for the patient obeys instructions not only in the letter, but in the spirit. It is at the same time naturally pleasing to the attendant and is calculated not only to raise his self-esteem, but also to enhance his reputation. He must not, however, allow such considerations as these to interfere with the ultimate welfare of the patient. From the point of view of an insurance company several things have to be considered. The medical referee of such a body will naturally prefer to see the clients of his company treated by the man who will send them back to work in the shortest time. It is well to point out in this connexion that an early return to work is sometimes followed by relapse. This may be the result of faulty treatment in the first instance, it may be caused by some foolhardy act of the patient or it may be simply that he has been allowed to return to work too early.

How, then, ought the treatment of fractures be divided among medical practitioners? For the purposes of this discussion medical practitioners

may be divided into three classes: the surgeon specialist, the general surgeon and the general practitioner. The latter group includes the suburban practitioner who proudly boasts that he "does his own surgery," but who does not add that he knows full well that he frequently exceeds his own limitations. It does not include general practitioners who, to quote the words of Sir George Syme, "by hard work, self-denial and limitation of their practice . . . find time and opportunity for such intensive course of scientific study and special hospital training." As far as surgeons are concerned it is necessary to differentiate those who treat patients with fractures because they cannot avoid doing so, from those who have made a special study of the subject.

An interesting statistical comparison has recently been made by R. N. Gray upon the disability and cost of industrial fractures treated by the specially trained surgeon and the general practitioner.¹ Gray has studied 34,753 compensation files of the Aetna Life Insurance Company, California, in order to determine what type of injuries should be transferred to the care of specialists. The opinion was held in his office that the specialist, even though he tended to the more expensive, was the cheapest in the end because he reduced the period of disability and minimized permanent injury. He has grouped the fractures according to the bone involved and has divided the surgeons into three classes: the San Francisco surgeon, a specialist who treated nearly all cases "of magnitude," the city surgeon who treated patients with fractures in five other large cities, and the "town physician" who treated patients in small towns or villages. These three groups correspond approximately with the three groups described as existing under Australian conditions, though in the discussion on his findings he appears to refer to both the city surgeon and town physician as general surgeons. He has recorded the temporary and permanent disability in each instance, the total medical expenditure, the amount paid to the doctor and the amount of compensation. Further subdivisions are made according to whether the patient was referred to the surgeon before or after two weeks had elapsed from the time of the injury. The findings may be summarized by stating that the surgeon who had been specially trained in the treatment of fractures, produced far better results in serious fractures than the other two groups. The other two groups did more efficient work in minor fractures. In major fractures the added cost produced by the specialist was more than compensated by decreased disability, but this was not true of minor fractures. Thus, in fractures of the femur the disability experienced by patients treated in the country was three times that of those treated in the five cities and four times the disability occasioned in San Francisco. In fractures of the fingers the best results were obtained by the country surgeons with a disability of 3.6 weeks, the city surgeons had a disability of 4.2 weeks

and the specialist a disability of nearly six weeks. Gray explains this by stating that the surgeon specialist but rarely treats so minor an injury as a fractured finger and will not risk allowing the patient to resume duty too soon. In fractures of the metatarsus the disability of patients treated by the specialist was a little over five weeks, patients of the "general surgeon" were away from work for eight weeks. The figures for fractures of the metacarpus were similar, but the cost of treatment of the specialist was lower than that of the general surgeon. Open fixation of fractures resulted in a much added cost and disability. Of the patients with fracture of the humerus 56% of those in San Francisco were operated upon, while only 11% of those in towns were similarly treated. Of the patients with fractures of the tibia and fibula 40% were submitted to operation. Only two-thirds of these operations were done by bone and joint surgeons. It is held that this fact explains the greater disability in the country group. At this point in his discussion Gray interpolates a plea for the restriction of bone surgery to those specially trained to undertake it. There can be no doubt that this is the ideal arrangement. Failure of an open operation for fracture, particularly through suppuration of the wound, is fraught with such danger and with so much suffering to the patient that every means should be used to attain this end.

When fractures of "intermediate importance" are considered by Gray the figures are interesting. With fractures of the radius and ulna combined the general surgeon made as good a record as the specialist. In the treatment of separate fractures of these bones the general surgeon closed his treatment even sooner. In fractures of the radius the country surgeon obtained as good a result with less than half the medical cost. The same conclusions were reached in regard to all fractures of intermediate importance. In seeking a reason for this, Gray states that the general surgeon or practitioner is closer to the human side of practice and is subconsciously trying to relieve his patients of expense. The specialist considers his patient's welfare without regard to time or money. In Australia the financial aspect of the matter is not the same as in America, for the greater number of patients with fractures of such bones as the femur and tibia and fibula are treated in public hospitals and pay nothing for their treatment. It must be pointed out also that in Gray's review the standard of good work is an early return to work. No account is taken of the state of the previously fractured bones or of the functional result. It is not suggested that the results found by Gray should be a guide for Australian practitioners in this matter. They do indicate, however, lines along which some guiding principles may be sought. Highly specialized knowledge is necessary for the treatment of some injuries, some men have it and there are means of making it available for nearly every sufferer who requires it. After all, the matter is in the hands of every individual practitioner, for each

¹ The Journal of Bone and Joint Surgery, January, 1928.

Abstracts from Current Medical Literature.

PHYSIOLOGY.

Blood Coagulation and Food Ingestion.

C. A. MILLS AND H. NECHELES (*Chinese Journal of Physiology*, January, 1928) have studied the variations in the coagulability of the blood after the ingestion of food and also the relation of this to bodily metabolism. They find that there is a definitely increased coagulability of the blood following meals. This is not due to the presence of food in the digestive tract, since carbohydrate and fat foods are without effect. Protein alone of the different foodstuffs seems able to bring on the shortening of the clotting time. Similar effects on the blood coagulability are produced by violent exercise or work and it would be suspected that the blood changes are intimately associated with changes in the body metabolism. Protein causes a large and consistent rise in metabolism, while carbohydrate and fat cause only a small rise.

Development of Infants on Soy Bean Diet.

ONE of the interesting paediatric problems in China is to search for an inexpensive substitute for cow's milk. Soy bean milk is a native food used in many parts of the country as a beverage, but not for infants. E. Tso (*Chinese Journal of Physiology*, January, 1928) has attempted more or less successfully to feed an infant six weeks of age for eight months on a soy bean milk diet. The experiment demonstrates that, properly supplemented, it can be made more or less comparable to cow's milk in nutritive properties. Soy bean milk is practically a milky filtrate of soy beans crushed up in water, containing 4.4% of protein, 1.8% of fat and 1.5% of carbohydrate. It contains only 0.018% of calcium and 0.057% of phosphorus, so is very deficient in these two substances. It also contains vitamins A and B, but no antirachitic factor. The child had a growth curve very little inferior to the American standard for the eight months of the experiment. A mild rickets developed which was not much influenced by cod liver oil until more calcium was given.

Reflexes from the Gastro-intestinal Tract to the Eye.

IT is a common experience that gastro-intestinal upsets may be associated with visual disturbances. Whether the gastro-intestinal upset is the cause of the visual disturbance or vice versa has not been agreed upon. J. F. Pearcey and T. D. Allen (*American Journal of Physiology*, September, 1927) have determined the effect of dilating the colon or stomach with air on vision. Either the colon was distended with air at an increased pressure of thirty to thirty-five milli-

metres of mercury through a colon tube or the upper intestinal tract was distended with air through a Rehfuss tube. The eye was carefully examined for ametropic or heterophoric changes and for change in the intraocular pressure. No such changes could be detected. Nevertheless, there was in these cases a temporary impairment of vision. Objects appeared blurred, especially near objects and there was difficulty in reading, partly due to blurring and partly due to wandering of the attention. The blurring is due to ciliary muscle hypertonia and retinal congestion and oedema. The subjective disturbances (wandering of the attention) are part of the general nervous reaction to the distension and are similar to those produced by eating a large meal.

Effect of Systemic Blood Pressure on the Pulmonary Circuit.

STARLING, ANREP and other workers with the heart-lung preparation have shown that the pulmonary arterial pressure increases almost proportionately to increase in systemic arterial pressure. L. N. Katz and C. J. Wiggers (*American Journal of Physiology*, September, 1927) have demonstrated that while such effects can occur in the heart-lung preparation, they do not occur in the intact circulation. The dynamics of the right heart is essentially different in the two arrangements. Changes in arterial resistance were produced by mechanical compression of the aorta and identical results were obtained when the increased arterial resistance was produced by reflex vasoconstriction. The small volume of blood retained during the first few systoles following compression of the aorta caused a slight elevation of initial pressure in the left ventricle and usually a slight increase in the diastolic pressure level within the left auricle. In the left ventricle this is accompanied by a steeper pressure gradient and a higher pressure maximum. The increased left auricular pressure has no effect on pulmonary arterial pressures; diastolic pressure in the pulmonary artery remains unaltered as long as the heart rate is the same and actually falls if it slows.

Gastric Hunger Motility in Healthy Men.

F. T. ROGERS AND C. L. MARTIN (*American Journal of Physiology*, September, 1927) have made a study of gastric hunger contractions in a series of five healthy men, radiographic and fluoroscopic examinations being made with simultaneous graphic records by the rubber balloon and manometer method. Gastric hunger motility is a mixture of at least two types of activity: first, hyperperistalsis and second, tonic or circular contraction of the lower third or antral end of the stomach. Visible tonic or maintained contractions of the fundus were not found to be constant characteristics of hunger contractions. There is a twenty-second pressure

rhythm shown in the graphic tracing associated with simple peristalsis. In some cases there was a maintained intragastric pressure due to either or both of two factors: first, increased constriction of the antral end of the stomach and second, hyperperistalsis at such a rate that a second wave appears before the preceding one has disappeared. There is almost complete obliteration of the lumen of the lower portion of the stomach at the height of hunger contraction. It is at this time that the subject feels the contraction most intensely.

The Difference of pH Between Plasma and Red Cells.

A. C. HAMPSON AND M. MAIZELS (*Journal of Physiology*, November, 1927) have determined the pH of the plasma and of the red cells in normal subjects and in certain cases of anaemia. The pH was determined in the plasma and in the red cells after freezing and thawing to produce laking by means of a glass electrode. In normal subjects the average difference of pH between cells and plasma was 0.094, the extremes in ten subjects being 0.051 and 0.12. The cells were more acid. In five cases of pernicious anaemia the pH difference varied between 0.20 and 0.48. In four cases of acholuric jaundice, the pH difference varied between 0.30 and 0.50. In two cases of non-haemolytic anaemia the pH differences were 0.037 and 0.120 respectively. In the haemolytic conditions the difference of pH between cells and plasma was increased as compared with normal, this difference varying directly with the degree of haemolysis (as estimated by the Van den Bergh test for bilirubin) and not with the degree of anaemia, nor with the alteration of fragility of the red cells to hypotonic saline solution. The pH of the plasma in the cases of anaemia was within normal limits, the acidity of the cells being increased.

Respiratory Metabolism in Infancy.

S. Z. LEVINE AND J. R. WILSON (*American Journal of Diseases of Children*, January, 1928) have continued their investigations on respiratory metabolism. They have measured the elimination of water through the skin and respiratory tract of four normal and six marantic infants in fifty-three calorimeter observations of from one and a half to four hours' duration. The temperature in all experiments ranged from 22° to 26° C. and the relative humidity from 35% to 60%. Work which the authors carried out previously with adults and children, was done under identical experimental conditions. They claim that in view of the rigidly controlled technique the experimental error probably does not exceed 10%. It was found that under these conditions the normal infants lost an average of 27% of the total amount of heat produced in vapourization; the marantic infants lost 26%. The extreme average figures for both groups were 23% and 30%. Only occasionally did the figures for individual observations

exceed that the insensitivity, adults to infarction, that the human old age, in the skin, 75% conducted

Irradiation

E. T. SMITH, PIGOTT, of C. endeavours irradiation, its and studies, medical and a rays lamp, careful dition and the young twenty group treated, nistic growth, calcinosis, the results. The method consists of a that to junc conc in g, minute vital rhad for its in b the oil

Sept. further of species, struc. oxid. it man from of sub acti enz Th pun

exceed this range. They conclude that the close relationship between insensible perspiration and metabolism, previously found to exist in adults and children, may be extended to infants, despite the differences in metabolic rates. It may be stated that under ordinary conditions the human subject from early infancy to old age dissipates approximately 25% of the total amount of heat produced in vapourization of water through the skin and lung and the remaining 75% by way of radiation and conduction.

BIOLOGICAL CHEMISTRY.

Irradiation of Cod Liver Oil and Its Antirachitic Potency.

E. T. WYMAN, A. D. HOLMES, L. W. SMITH, D. C. STOCKBARGER AND M. G. PIGOTT (*American Journal of Diseases of Children*, November, 1927) have endeavoured to determine whether the irradiation of cod liver oil increases its antirachitic potency. They have studied the antirachitic potency of medicinal cod liver oil both before and after irradiation with ultra-violet rays from a quartz mercury vapour lamp. The oil was irradiated under carefully controlled experimental conditions for periods of thirty minutes and two hours. The oil was fed to young albino rats. The rats numbered twenty and were divided into five groups, one of these groups was treated as a control group. The diagnostic features considered were growth curves, the concentration of calcium and phosphorus in the blood, the skiagraphic appearances and the results of pathological examination. The results obtained by these four methods of examination were "fairly consistent" for each of the five groups of animals. The author points out that the series of animals is too small to justify the formation of definite conclusions. He states, however, that in general the results of his study show that the irradiation for thirty minutes of a cod liver oil potent in vitamins does not enhance its antirachitic power and that irradiation for two hours noticeably decreases its antirachitic activity. There is in his opinion no adequate reason for the therapeutic treatment of cod liver oil by ultra-violet rays.

Oxidase Ferments.

H. I. COOMBS (*Biochemical Journal*, September, 1927) has made some further investigations into the action of ferments. The study of the specificity of enzymes for their substrates with the aid of the xanthine oxidases offers some advantages since it is possible to use as substrate so many substances differing slightly from one another. This action is also of interest since the adsorption of the substrate on the enzyme and the activation of the substrate by the enzyme can be studied separately. This is due to the fact that the purines that are adsorbed on the enzyme, inhibit the reduction of

methylene blue by the oxy-purine owing to the formation of an interfering film on the surface of the enzyme. Activation is detected by observing the reduction of methylene blue, while, on the other hand, adsorption can be deduced from the effect of purine on the velocity of the reduction of the dye by oxy-purine. The author has noted the effect of structure upon activation by testing various purines. Two purines, other than hypoxanthine, xanthine and adenine have been found to be activated by the xanthine oxidase of fresh milk. These purines are 6,8-dihydroxypurine and 2-thioxanthine. It would seem that one molecule of each of these substances reduces one molecule of methylene blue and that uric acid and thiouric acid are the products of oxidation. The introduction of a single methyl group in either the pyrimidine or the imidazole ring of the purine nucleus entirely prevents activation. In respect to adsorption of the substrate on the surface of the enzyme the purines fall into three groups, those strongly absorbed, those absorbed to only a small extent and those not absorbed. An inspection of the purines in these groups shows that neither the pyrimidine nor the imidazole ring can by itself cause adsorption, but it seems necessary to have the complete purine nucleus. No pyrimidines are adsorbed, nor imidazole compounds such as histidine. When a benzene ring replaces a pyrimidine ring in the purine nucleus, no adsorption on the enzyme is observed. On the other hand the presence of the imidazole ring seems to be necessary for adsorption since uracil is not adsorbed. The introduction of a methyl group into the imidazole ring tends to prevent adsorption, while the introduction of an amino group favours adsorption. The evidence so far obtained has not made it possible to explain the mechanism of adsorption on the surface of the xanthine oxidase. These experiments have an interest in the information that they supply in respect to the clear indications they give of the interfacial changes regulating the actions of enzymes and give rise to their effects.

Effects of Use of Cod Liver Oil.

D. HARVEY (*Biochemical Journal*, September, 1927) has made an investigation on goats on the effects of giving cod liver oil upon the calcium and phosphorus metabolism in the lactating animal. The amounts of calcium and phosphoric acid have been measured in the urine, faeces and milk and in the ration over periods from sixteen to twenty days. When cod liver oil is added to the diet the balance of calcium retained in the body is increased. This is due to a lessened amount of calcium in the faeces. In the late stages of lactation the percentage of lime in the milk and the total amount of lime excreted in the milk is increased by feeding cod liver oil. The quantity of fats in the milk is not altered by the administration of cod liver oil. Experiments in which cod liver oil has been

replaced by olive oil plus iodide of potassium have not shown the effects on calcium metabolism. It would appear, however, that the exhibition of potassium iodide increases the amount of iodine in the milk in the same way that the iodine in the milk is increased by giving cod liver oil.

The Iron Reserve in the Body.

C. S. WILLIAMSON AND H. N. ERS (*Archives of Internal Medicine*, November 15, 1927) have made an investigation into the question of the iron reserve of the body. They have previously shown that ferric citrate, given in the food and by subcutaneous injection, builds up an iron reserve in the tissue and in common with other observers have noted that iron in the food is capable of being quickly and efficiently used in the formation of haemoglobin. They have now tried to determine to what extent, if any, iron in the food can be stored in the body in a utilizable form. They have used dogs and rats in their experiments. In the first set of experiments the animals were placed on two different diets. In the diet given to the dogs part of the bread and milk in one diet was replaced by beef spleen in the other. A standard casein diet was given to the rats and this was modified for some of them by the substitution of dried liver for part of the casein. It was found that the concentration of haemoglobin of the dogs on the two diets was about the same and that the dogs on the diet containing spleen had much more iron in their livers and spleens than the dogs on the other diet. It was also found that iron was stored in the tissues of rats on the liver diet; the concentration of haemoglobin remained the same, since there was enough iron in the casein diet to replace the normal amount of destruction of haemoglobin. In the second set of experiments rats were put on the same two diets. After they had been bled, the animals which had been on the casein diet, gave practically no evidence of regeneration of haemoglobin. The rats which had been on the liver diet, gave entirely different results; their haemoglobin value gradually improved and by the twenty-eighth day was nearly back to normal. In the third set of experiments the rats on the casein diet which had been allowed to remain on the standard casein diet after bleeding, were placed on the liver diet. After twenty-four days the haemoglobin value of these animals was at a normal level. The general conclusions of the author are that (i) a reservoir of readily utilizable iron can be built up in the livers and spleens of rats by placing them on a diet containing liver; (ii) this stored iron is capable of being used in the regeneration of haemoglobin after the production of an anaemia by bleeding; (iii) rats rendered anaemic by bleeding, when their iron reserve has been exhausted, recover their concentration of haemoglobin rapidly on being placed on a diet containing liver and simultaneously build up a reserve of iron in their livers and spleens.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at Brisbane General Hospital, on February 3, 1928. The meeting took the form of a series of clinical demonstrations.

Epithelioma of the Ear.

Dr. B. H. CLARKE showed a very satisfactory result after treatment of an extensive epithelioma of the ear with diathermy and deep X ray therapy.

Fracture of the Femur.

Dr. A. C. DOUGLAS showed a male patient, aged fifty-eight, who had been thrown from a cart and had sustained a fracture of the neck of the right femur. On admission the leg had been externally rotated and shortened 3·75 centimetres (one and a half inches). X rays had revealed a fracture of the neck of the femur, intracapsular but not intraarticular.

The patient had been anaesthetized and Whitman's method of treatment adopted. Both legs had been extended, then the injured member had been internally rotated and finally both legs had been abducted to the full extent of abduction allowed by the sound leg. While this was being done the upper end of the femur had been lifted to its normal height. Extension being kept up in this position, a plaster spica had been applied, extending from the level of the nipples to and including the whole leg and foot. The plaster had been reinforced with several steel strips which made the casing much more secure.

Eight weeks later X rays had shown the bone to be in good position with union. The plaster had then been removed. The leg had been placed between sand bags and gradually brought to an adductor position and massage and movement had then been instituted.

Three weeks later the patient had been fitted with a walking caliper which would be worn till X rays revealed a well consolidated callus.

Dr. Douglas pointed out that the advantages of Whitman's method were the absolute freedom from pain and the facility of movement of the patient, thus avoiding the risk of hypostatic pneumonia.

Fractured Pelvis with Dislocation of Head of Femur.

Dr. Douglas also showed a patient, a male, aged eighty-two, who had been knocked down by a tram. On admission he had had numerous abrasions and contusions to the body with dislocation (subcoracoid) of the right shoulder and fracture of the pelvis. There had been very little shock and the dislocation of the shoulder had been reduced easily. X rays had revealed fracture of the thigh through the ramus of the pubis and ischium with separation of the *syphysis pubis* and rotation of this fragment, so that the outer end was pushed into the pelvis. A fracture through the upper part of the acetabulum extended upwards towards the sacro-sciatic notch and there was also possibly some splitting of bone in the neighbourhood of the sacro-iliac joint.

By fixing the pelvis, extending the thigh with a lateral pull on the upper part of the thigh, the lesion had been reduced satisfactorily and retained by plaster; the injured thigh had been kept forcibly adducted with a pad between the thigh as a fulcrum. This, however, had not remained in position and two days later the plaster had been removed and extension made in bed: 6·75 kilograms (fifteen pounds) extension to the leg and a lateral pull of the same weight at the upper part of the thigh. The pelvis meanwhile had been fixed by a swathe to give counter traction to the lateral pull. In twenty-four hours the fractures and dislocation had been reduced completely and the weights had then been reduced to 4·5 kilograms (ten pounds). His general condition was good.

Pernicious Anæmia.

Dr. D. A. DAVIS showed two patients suffering from pernicious anæmia who had been treated by liver feeding.

The first patient on admission to hospital had been sufficiently ill to be placed on the "Seriously Ill" list. Pernicious anæmia had been diagnosed and she had been put on to three hundred grammes (ten ounces) of liver daily. Improvement had been noticed almost immediately.

The patient's blood had been examined on December 22, 1927, with the following result:

| | |
|------------------------------------|---------|
| Erythrocytes, per cubic millimetre | 600,000 |
| Hæmoglobin value | 16% |
| Colour index | 1·2 |
| Leucocytes, per cubic millimetre | 2,700 |

Some nucleated red cells had been seen and pronounced poikilocytosis and anisocytosis had been present, together with polychromasia and punctate basophilia. A delayed direct reaction had been obtained to the Van den Bergh test. No reaction had been obtained to the Wassermann test.

On January 23, 1928, another blood examination had been made with the following result:

| | |
|------------------------------------|-----------|
| Erythrocytes, per cubic millimetre | 2,460,000 |
| Hæmoglobin value | 50% |
| Colour index | 1 |
| Leucocytes, per cubic millimetre | 5,400 |

No nucleated red cells had been seen, but some anisocytosis had been present.

On February 3, 1928, another blood examination had been made with the following result:

| | |
|------------------------------------|-----------|
| Erythrocytes, per cubic millimetre | 2,720,000 |
| Hæmoglobin value | 60% |
| Colour index | 1·1 |
| Leucocytes, per cubic millimetre | 3,200 |

No reaction had been obtained to the Van den Bergh test.

The second patient had been similar to the first. On admission on December 22, 1927, her blood had been examined with the following result:

| | |
|------------------------------------|---------|
| Erythrocytes, per cubic millimetre | 690,000 |
| Hæmoglobin value | 15% |
| Colour index | 1·2 |
| Leucocytes, per cubic millimetre | 5,700 |

Pronounced anisocytosis and poikilocytosis had been present, but no nucleated red cells had been seen. On February 3, 1928, her blood had been examined again with the following result:

| | |
|------------------------------------|-----------|
| Erythrocytes, per cubic millimetre | 2,760,000 |
| Hæmoglobin value | 15% |
| Colour index | 1 |
| Leucocytes, per cubic millimetre | 4,000 |

Anisocytosis and poikilocytosis had not been pronounced and no nucleated red cells had been seen.

Both patients had commenced their liver feeding on the same day. Their daily diet for the first ten days had been liver, 90 grammes (three ounces); onions, 120 grammes (four ounces); beans, 120 grammes; cabbage, 120 grammes; one baked apple; 568 cubic centimetres (one pint) of unboiled milk; two eggs; 120 grammes of brains or roast meat; 120 grammes of tomato; bread, tea, coffee *ad libitum*.

The amount of liver was gradually increased to 240 grammes (eight ounces) daily. The first patient was given six cubic centimetres (one and a half fluid drachms) of dilute hydrochloric acid with each meal and also 0·3 mil (five minims) of *liquor arsenicalis*.

The second patient had not been given any drug treatment and the improvement in this case appeared to be equal to that seen in the first patient.

Dr. D. G. CROLL stated that he considered it very important to continue to give hydrochloric acid to these patients, as it was his opinion that achlorhydria was a very probable aetiological factor in pernicious anæmia.

Dr. EUSTACE RUSSELL stated that he had had considerable experience of the treatment of pernicious anæmia patients

with liver and hydrochloric acid since it was first described by Murphy and Minot in August, 1926. The effect was dramatic and persistent, even in patients with subacute combined degeneration of the cord, some of whom had recovered their function. The distaste for liver was an objection with some, but this could be overcome by following the series of recipes published in *The Journal of the American Medical Association* in September, 1927. The juice extracted from the liver had equally good results.

He described one patient who had been on arsenic and hydrochloric acid for months without improvement, but when put on liver feeding, he had returned to work in a short time. He had then given up all treatment and had become almost moribund again. After some persuasion he had once more taken liver juice and was quite well. Dr. Russell said that he had entirely abandoned the use of arsenic in his practice.

Chronic Osteitis.

DR. NEVILLE SUTTON showed a married man, forty-five years of age, who was employed as a miner. He had been suffering from chronic osteitis of the left semilunar bone for the previous ten months. Dr. Sutton said that he intended to report this case fully at a later date.

Brodie's Abscess.

Dr. Sutton also briefly outlined the technique of Rutherford Morison for filling infected bone cavities with free fat grafts with the aid of bismuth, iodoform and paraffin paste, "B.I.P.P." and referred to a patient suffering from Brodie's abscess of the lower end of the tibia that he had recently treated by this method with a very pleasing result and a great saving of time to the patient.

Chronic Duodenal Ulcer and Achlorhydria.

DR. ALAN E. LEE showed a patient with chronic duodenal ulcer associated with achlorhydria. He said that he showed the patient because of the interesting association of a proved duodenal ulcer with achlorhydria.

The patient, a woman of forty, had had abdominal symptoms for eight years. These were not present during the day time, but she was accustomed to wake up between 11 p.m. and 1 a.m. with a constant gnawing upper abdominal pain. This continued for a variable time, usually several hours, till she vomited and then relief was obtained and she would sleep.

During earlier years there had been complete remissions of symptoms for as long as six months, but lately the condition had been very continuous. It seemed that these symptoms, if they had any local physical basis, were those of chronic duodenal ulcer.

The report of a fractional test meal was that there was no free hydrochloric acid in any specimens. The total hydrochloric acid in no specimen was more than eight. Mucus was abundant in all specimens. The X ray report on a barium meal was that the stomach was affected by hypotonus and hyperperistalsis. Doubtful deformity was present at the pylorus and the first part of the duodenum, resembling small duodenal ulcer. A gall-stone was visible in the plate.

Operation had been undertaken primarily as an exploratory measure and secondly to remove the gall-stones. The gall bladder had been found distended with stones and a duodenal ulcer had been present on the anterior surface of the first 2.5 centimetres (one inch) of the duodenum, contracting it down to a diameter little thicker than that of a pencil.

A free gastric ulcer sixteen millimetres (two-thirds of an inch) in diameter had been present high up on the lesser curvature of the stomach. Cholecystectomy and gastro-jejunostomy had been performed.

Fracture Dislocation of the Pelvis.

Dr. Lee showed a patient who had suffered from fracture dislocation of the pelvis as illustrating the remarkable way in which Nature restored badly damaged bones to their previous condition. The patient had been dragged along the ground by a moving railway train and on admission to hospital the *syphysis pubis* had been found completely

torn through, the pubic bone being 2.5 centimetres (one inch) or more apart and the right side at least 2.5 centimetres higher than the left. There had been present a fracture of the right pubis with displacement and several breaks in the ilium near the right sacro-iliac joint. Other extensive injuries, including a ruptured bladder, had needed much attention and no special measure had been adopted towards the broken bones, except that the patient had been kept quiet in bed. Yet ten weeks after the injury a further X ray examination revealed what appeared to be a normal pelvis with the pubic bones together and in line. There were no traces of the deforming fractures which were to be seen in the previous plate, and generally speaking there was a complete return to the architecture of a normal pelvic girdle.

Pulmonary Tuberculosis.

DR. ALEX MURPHY showed two patients with pulmonary tuberculosis treated by artificial pneumothorax. In the first patient, after two injections of 400 cubic centimetres and 700 cubic centimetres respectively, the lung was seen to be prevented from further collapse by two strong bands of adhesions, extending from the costo-phrenic angle. The next injection had been given under positive pressure equal to ten centimetres of water and resulted in breaking down of the adhesions and complete collapse of the lung. In the second patient the X ray appearances had been those of thickened pleura which in the opinion of the radiographer would prevent collapse. However, in spite of the unfavourable outlook, complete collapse had been obtained after five injections of air. The first patient showed very rapid improvement, cough and sputum having practically ceased in three weeks. The second was also improving, but more slowly.

DR. A. JEFFERIS TURNER considered artificial pneumothorax extremely valuable in treating suitable patients, especially those with one-sided lesions. He had been doing this work for nine years and considered it should be tried in all one-sided lesions which had not improved after three months' sanatorium treatment. He found that he obtained better results with women than with men, as they had more patience. He did not advise its use when both lungs were involved.

DR. JOHN BOSTOCK showed skiagrams of the dorsal and lumbar vertebrae taken after "Lipiodol" injections. He remarked that recent work had proved the existence of spinal block, though from the clinical signs none had been suspected. It was therefore an extremely useful aid in diagnosis. Even when neurological signs localizing a block were present, this could be mapped out with far greater accuracy than by any other means. No risks were involved. The method followed was to inject two cubic centimetres of "Lipiodol" *descendans* by cisternal puncture. The patient then remained in the sitting upright position and a radiograph of the spine was taken one and a half and three hours later.

In one patient whose skiagram showed block, the lower level had been defined by "Lipiodol" introduced by lumbar puncture. In two other patients known to have cord changes with the localizing signs, the "Lipiodol" had sunk rapidly to the level of the first and second sacral vertebrae respectively. In a fourth the signs were more definite; in addition to trophic changes in both feet together with spasticity he had spinal curvature and a zone of hyperesthesia corresponding to the fifth lumbar and first sacral roots. There was a complete spinal lock at the level of the seventh and eighth dorsal vertebrae. This was due to a spinal abscess of a probably tuberculous nature.

Carcinoma of the Head and Neck.

DR. E. S. MEYERS showed five patients suffering from carcinoma of the head and neck.

The first was a male, aged sixty-five years. He had suffered from carcinoma of the floor of the mouth with limitation of movement of the tongue and enlarged glands in the submental triangles. At operation the floor of the mouth had been completely excised with the glands of the neck, all cut surfaces had been touched with the Paquelin cautery. The wound was quite clean and the patient's general condition was good.

The second patient was a male, aged forty-one years. He had suffered from a hard infiltrated ulcerating carcinoma of basal cell type, involving the right half of the tip of the tongue. The lesion had been excised by diathermy.

The third patient was a male, aged sixty-five years. He had had a swelling of the neck for eighteen months. This had been removed in the country about a year previously. It had slowly recurred and had presented a fungating mass. At operation the external carotid artery had been clamped and the whole mass dissected off the maxilla and mandible, the zygoma being cut through. He had since been examined by X rays and there was almost complete epithelial covering with no sign of recurrence and no palpable glands.

The fourth patient was a male, aged sixty-two years, who gave a history of having had a growth removed from the neck six months previously. An ulcer had appeared at that area four months later with induration in the parotid and post-auricular region and palpable glands on the right side of the neck. He had been treated with diathermy, but a large fungating mass was still present.

The fifth patient was a male, aged forty-two years, who had suffered from epithelioma of the lower lip of eighteen months' duration. The tumour had been removed by cauterity with all the glands of the left side of the neck. His general condition was very good and he was awaiting removal of glands of the other side of the neck.

DR. H. J. TAYLOR then demonstrated sections of these tumours under the microscope.

Deformity of the Hand.

DR. C. M. LILLEY showed a child with a hand deformity following an injury. The hand had been crushed by a truck. There was present superficial osteomyelitis of the fingers with practically a condition of syndactylism, the fingers having fused together. He suggested that nothing should be done until all sequestra were formed and then a skin graft should be carried out.

DR. A. E. LEE stated that he had had this patient under his care for some time in the out-patient department. The question of prognosis was then raised in connexion with compensation. The insurance office had regarded the hand as permanently disabled and wished the child's parents to accept a lump sum as final compensation.

Dr. Lee had advised the child's parents to accept this offer, as it seemed to him that a very useful hand ought to result from reconstructive surgery. Apart from the damage sustained by the extensor tendons to the ulnar three fingers, the disability was very largely due to the hyperextension of the metacarpo-phalangeal joints resulting from the contraction of scar tissue on the dorsum of the hand, thus preventing apposition of the intact thumb.

In his opinion the reconstruction would involve: (i) The removal of certain metacarpal sequestra, (ii) the excision of the scar tissue from the dorsum of the hand, freeing of tendons and separation of fingers, (iii) flexing the metacarpo-phalangeal joints and dorsi-flexing the wrist and finally the replacement of the scar tissue excised by a whole skin graft.

THE ANNUAL MEETING OF THE SECTION OF PÆDIATRICS OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held in the Lecture Hall at the Royal Alexandra Hospital for Children, Sydney, on March 23, 1928, DR. E. H. M. STEPHEN, the Chairman, in the chair.

Election of Office-Bearers.

The following office-bearers were elected for the ensuing twelve months:

Chairman: Dr. Harvey Sutton.

Vice-Chairmen: Dr. P. L. Hipsley, Dr. W. Vickers.

Members of Committee: Dr. G. R. P. Hall, Dr. R. A. Parker, Dr. A. W. Campbell, Dr. E. H. M. Stephen, Dr. T. Y. Nelson, Dr. Lindsay Dey.

Honorary Treasurer: Dr. R. A. Green.

Honorary Secretaries: Dr. F. C. Rogers, Dr. M. J. Plomley.

Retiring Chairman's Address.

The retiring Chairman, Dr. E. H. M. Stephen, delivered an address entitled: "Some Points of Clinical Interest Occurring During the Year" (see page 524).

On the motion of Dr. A. W. Campbell, seconded by Dr. W. Vickers, a vote of thanks was accorded to Dr. Stephen for his address.

THE INAUGURAL MEETING OF THE PHYSIO-THERAPY SECTION OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Medical Society's Hall, East Melbourne, on April 5, 1928. DR. H. MURRAY was elected Chairman and DR. G. R. BALDWIN, Honorary Secretary.

DR. H. MURRAY read a paper entitled "A Plea for Physio-Therapy" (see page 525).

The secretary read a letter from Dr. Sidney Pern in which he expressed pleasure at the institution of the Section and commented on the remarkable results of the therapeutic use of diathermy.

The following motion was carried:

That the Physio-therapy Section of the Victorian Branch of the British Medical Association suggests to the Council that those who use light and diathermy in the treatment of disease, should themselves be or only act under the supervision of legally qualified medical practitioners.

It was resolved that future meetings be held at 8.30 p.m., that the next meeting be held on the third Thursday of May and it was announced that a paper would be read at the meeting by Dr. Sidney Pern.

It was also decided that the subsequent meeting should take the form of a clinical meeting at the Melbourne Hospital.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Ashby, Gilbert Waters, M.B., Ch.M., 1924 (Univ. Sydney), 417, Forest Road, Penshurst.
 Blackall, Moya Kathleen, M.B., B.S., 1927 (Univ. Sydney), Killard, Queanbeyan.
 Chenhall, Frederick Nicholas, M.B., B.S., 1927 (Univ. Sydney), University Club, Sydney.
 Darton, Jack Kenneth, M.B., Ch.M., 1927 (Univ. Sydney), Strathfield.
 Dilger, Ronald Frederick, M.B., B.S., 1928 (Univ. Sydney), Kissing Point Road, Turramurra.
 Eppel, David, L. et L.M., R.C.P. et S. (Ireland), 1922, Silva Street, Bondi.
 Fisher, Walter Edward, M.B., Ch.M., 1925 (Univ. Sydney), 14, Albemarle Avenue, Rose Bay.
 Herrernan, Patrick Gabriel, M.B., Ch.M., 1926 (Univ. Sydney), 48, Macaulay Road, Stanmore.
 Wallace, Kenneth Stewart, M.B., Ch.M., 1926 (Univ. Sydney), c/o F. J. Kirby, Esquire, 12, Spofforth Street, Cremorne.

Medical Societies.

THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING OF THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA was held at the Adelaide University on December 2, 1927.

The Ovarian Hormone.

DR. R. F. MATTERS read a paper entitled: "Ovarian Endocrine Functions and Their Relation to Metabolism: A Preliminary Note" (see page 520).

PROFESSOR H. H. WOOLLARD stated that in *Macacus rhesus* the ovum was naked and no luteal cells were conveyed to the placental side. The oestrin in the placenta was formed in the placenta itself. He stated that there were at least three secretions, oestrin, lutein and one responsible for the formation of secondary sex characters.

PROFESSOR C. S. HICKS challenged this suggestion, stating that he considered that the evidence pointed to only one hormone being necessary for all the facts discovered.

From this Professor Woollard did not demur, but suggested that there were at least separate anatomical sources for the secretion. He cited the case of the Free-Martin in which no ovarian follicles were present to be responsible for the internal secretion.

Dr. W. RAY asked if the presence of ovarian cysts was responsible for continued oestrus combined with infertility in certain blood stock.

Dr. MATTERS stated that he thought such might be the case.

Dr. B. SWIFT asked Dr. L. V. BULL whether facilities could be arranged for biological testing of commercial ovarian hormones.

Dr. MATTERS stated that his own experimental work showed that few commercial extracts were active.

The Use of "Lipiodol" for Diagnosis.

Dr. A. R. SOUTHWOOD gave an account of his experience in the use of "Lipiodol" in intrathecal and intrapulmonary diagnostic work. He demonstrated by means of X ray photographs the presence of the "Lipiodol" in the spinal theca and in the bronchial tree and described the technique of injection into the *cisterna magna*. He stated that in the case of the intrapulmonary injection it had been done to investigate possible bronchiectasis and that a surprising therapeutic result was demonstrated in that the subject's bronchitis was distinctly improved.

Dr. W. RAY stated that he did not consider its use in spinal tumour diagnosis justified; he held that clinical observations offered better results. In therapy he thought that the high atomic weight of iodine might lend it to the development of secondary irradiation from X ray exposure.

Vaginal Smears.

DR. R. F. MATTERS gave a demonstration of vaginal smears from the animals upon which he had experimented.

Obituary.

HAROLD EDGAR FEATHERSTONE.

WE regret to announce the death of Dr. Harold Edgar Featherstone which occurred at the Repatriation Hospital, Caulfield, Victoria, on April 12, 1928.

HERBERT JOSEPH BIRMINGHAM.

WE regret to announce the death of Dr. Herbert Joseph Birmingham which occurred at Narooma, New South Wales, on April 11, 1928.

Proceedings of the Australian Medical Boards.

NEW SOUTH WALES.

THE undermentioned have been registered under the provisions of *The Medical Act 1912 and 1915*, of New South Wales, as duly qualified medical practitioners:

Blumer, Alfred Conrad, M.B., B.S., 1928 (Univ. Sydney), Beecroft Road, Beecroft.
 Brown, David Richmond, M.B., 1928 (Univ. Sydney), Wandene, Berrima, *via* Moss Vale.
 Clemens, Kathleen, M.B., 1928 (Univ. Sydney), Centennial Avenue, Chatswood.
 Cook, Leslie James, M.B., B.S., 1928 (Univ. Sydney), St. Andrew's College, Newtown.
 Cottrell, Jack Dinham, M.B., B.S., 1928 (Univ. Sydney), Warriella, Wentworth Falls.
 Coyle, William Thomas, M.B., 1928 (Univ. Sydney), Warrawee Flats, New South Head Road, Rose Bay.
 Cummins, George, M.B., 1928 (Univ. Sydney), Alice Street, North Lakemba.
 Delamoth, Peter Royleance, M.B., 1928 (Univ. Sydney), 15 Milton Street, Ashfield.
 Dick, Robert, M.B., Ch.B., 1923 (Univ. Edinburgh), F.R.C.S., 1926 (Univ. Edinburgh), 7, Benelong Crescent, Bellevue Hill.
 Dilger, Ronald Frederick, M.B., B.S., 1928 (Univ. Sydney), Kissing Point Road, Turramurra.
 Fulton, William, M.B., Mast. Surg., 1892 (Univ. Glasgow), c.o. Bank of New Zealand, George Street, Sydney.
 George, Noel Francis, M.B., B.S., 1928 (Univ. Sydney), 183, Avoca Street, Randwick.
 Haddow, Phyllis, M.B., Ch.B., 1923 (Univ. New Zealand), 11, Jones Road, Concord.
 Harbison, Victor Roy, M.B., B.S., 1928 (Univ. Sydney), St. Andrew's College, Newtown.
 Hawker, John Kenrick Alva, M.B., 1928 (Univ. Sydney), 28, Bay Road, Balmain.
 Lane, Albert Stephen, M.B., 1928 (Univ. Sydney), 51, Louisa Road, Balmain.
 McManamey, John, M.B., B.S., 1928 (Univ. Sydney), 68, Pitt Street, North Sydney.
 Morgan, Milton Barden, M.B., B.S., 1928 (Univ. Sydney), 33, Findlay Avenue, Roseville.
 Ross, Angela Mary, M.B., 1928 (Univ. Sydney), 35, Arundel Street, Forest Lodge.
 Ross, Thomas Gordon, M.B., B.S., 1903, 1904 (Univ. Melbourne).
 Scott, Ronald Barrow, M.B., 1928 (Univ. Sydney), Springdale Road, Killara.
 Segal, Reuben, M.B., B.S., 1928 (Univ. Sydney), 324, Birrell Street, Bondi.
 Smith, Frederick William, M.B., 1928 (Univ. Sydney), 2, Spencer Street, Summer Hill.
 Stevens, Stanley Gordon, M.B., B.S., 1928 (Univ. Sydney), Mental Hospital, Orange.

For additional registration:

Dive, Wilfred Royle, Ch.M., 1928 (Univ. Sydney).
 O'Donoghue, Francis Martin, Ch.M., 1928 (Univ. Sydney).
 Smith, Alan Victor, Ch.M., 1928 (Univ. Sydney).

Change of name:

Sheehy, Margaret Mary Madeline, to Jones, Margaret Mary.

QUEENSLAND.

THE undermentioned have been registered under the provisions of *The Medical Act of 1925*, of Queensland, as duly qualified medical practitioners:

Davidson, Peter McLean, M.R.C.S. (England), L.R.C.P. (London), 1925, Brisbane.
 Foote, Ambrose John, M.R.C.S. (England), L.R.C.P. (London), 1925, Brisbane.

Restoration to the Register:

Webster, Barclay Parsons, M.B., Ch.M., 1925 (Univ. Edinburgh), Murgon.
 Cilento, Raphael West, M.D., 1922 (Univ. Adelaide), Brisbane.
 Sproule, Robert, M.B., B.S., 1902 (Univ. Edinburgh), Gatton.

Books Received.

OUTLINES OF SCIENTIFIC ANATOMY FOR STUDENTS OF BIOLOGY AND MEDICINE, by Dr. Wilhelm Lubosch; Translated from the German by H. H. Woollard, M.D.; 1928. London: John Bale, Sons and Danielson, Limited. Royal 8vo., pp. 405, with illustrations. Price: 21s. net.

PRINCIPLES OF ABNORMAL PSYCHOLOGY, by Edmund S. Conklin; 1928. London: George Allen and Unwin, Limited. Royal 8vo., pp. 457. Price: 18s. net.

SURGICAL "DON'TS" (AND "DO'S"), by C. Hamilton Whiteford, M.R.C.S., L.R.C.P.; Second Enlarged Edition; 1928. London: Harrison and Sons, Limited. Crown 8vo., pp. 68. Price: 4s. net.

ASTHMA, ITS DIAGNOSIS AND TREATMENT, by William S. Thomas, M.D.; 1928. New York: Paul B. Hoeber, Incorporated. Royal 8vo., pp. 290, with illustrations. Price: \$7.50 net.

THE MECHANICS OF THE DIGESTIVE TRACT: AN INTRODUCTION TO GASTROENTEROLOGY, by Walter C. Alvarez, M.D.; Second Edition; 1928. Paul B. Hoeber, Incorporated. Royal 8vo., pp. 467, with illustrations. Price: \$7.50 net.

Diary for the Month.

MAY 1.—Tasmanian Branch, B.M.A.: Council.
 MAY 2.—Victorian Branch, B.M.A.: Branch.
 MAY 2.—Western Australian Branch, B.M.A.: Council.
 MAY 3.—South Australian Branch, B.M.A.: Council.
 MAY 4.—Queensland Branch, B.M.A.: Branch.
 MAY 8.—Tasmanian Branch, B.M.A.: Branch.
 MAY 8.—New South Wales Branch, B.M.A.: Ethics Committee.
 MAY 10.—Victorian Branch, B.M.A.: Council.
 MAY 10.—New South Wales Branch, B.M.A.: Clinical Meeting.
 MAY 11.—Queensland Branch, B.M.A.: Council.
 MAY 15.—Tasmanian Branch, B.M.A.: Council.
 MAY 16.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 MAY 16.—Central Northern Medical Association, New South Wales.

Medical Appointments.

Dr. Edward Robertson (B.M.A.), Dr. Jane Stocks Greig (B.M.A.), Dr. W. Ernest Jones (B.M.A.) and Dr. Clarence G. Godfrey (B.M.A.) have been appointed Members of the Midwives' Board of Victoria.

Dr. John Coffey (B.M.A.) has been appointed Deputy Commissioner of Public Health, Queensland.

Dr. W. Lockhart Gibson (B.M.A.) has been appointed Honorary Relieving Medical Officer to the Brisbane General Hospital, Queensland.

Dr. Farquhar William Fraser (B.M.A.) has been appointed Acting Government Medical Officer at Longreach, Queensland.

Dr. Henry John Taylor (B.M.A.) has been appointed Government Medical Officer at Townsville, a Health Officer for the purposes of *The Health Acts, 1900 to 1922* and Medical Officer to the State Children Department, Townsville, Queensland.

Dr. Frederick Challands (B.M.A.) has been appointed Manager and Medical Superintendent, Benevolent Asylum, Dunwich, Queensland.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii.

CAIRNS HOSPITALS BOARD: Assistant District Medical Superintendent.

CHILDREN'S HOSPITAL, CARLTON, VICTORIA: Medical Superintendent.

MANLY COTTAGE HOSPITAL: Resident Medical Officer.

ROCKHAMPTON HOSPITALS BOARD: Resident Medical Officer.

THE UNIVERSITY OF SYDNEY: Temporary Physician.

THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

| BRANCH. | APPOINTMENTS. |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NEW SOUTH WALES: | Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society. |
| VICTORIAN: | All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria. |
| QUEENSLAND: | Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital. |
| SOUTH AUSTRALIAN: | All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club. |
| WESTERN AUSTRALIAN: | All Contract Practice Appointments in Western Australia. |
| NEW ZEALAND (WELLINGTON DIVISION): | Friendly Society Lodges, Wellington, New Zealand. |

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of *THE MEDICAL JOURNAL OF AUSTRALIA*, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to *THE MEDICAL JOURNAL OF AUSTRALIA* alone, unless the contrary be stated.

All communications should be addressed to "The Editor," *THE MEDICAL JOURNAL OF AUSTRALIA*, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

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